Unit 1

ENERGY

Remember what you have learnt in this unit through the following points:

① Definitions
② Importance and uses
③ Give a reason
④ What happens if ...?
⑤ Comparisons
⑥ Main points

Unit 1
Energy

1. Definitions

Concept	Definition
Light	It is a form of energy that causes vision.
The visible spectrum	It is the light energy which can be seen.
Shadow	It is a darkened area that is formed when light falls on an opaque object.
Transparent materials	They are materials that allow most light to pass through and things can be seen clearly behind them.
Semi-transparent (translucent) materials	They are materials that allow some light to pass through and things can be seen less clearly behind them, compared to the transparent ones.
Opaque materials	They are materials that light cannot pass through them, and things cannot be seen behind them.
Light reflection	It is the bouncing (returning back) of light rays when they fall on a reflecting surface.
Regular reflection	It is the reflection of light when it falls on a smooth and shiny reflecting surface where light rays are reflected directly in one direction.
Irregular reflection	It is the reflection of light when it falls on a rough reflecting surface where light rays are reflected and scattered in different directions.
Light refraction	It is the change in the direction of light rays when they pass through a separating surface between two transparent media due to the change in light speed.
Separation (splitting) of light	It is the splitting of white light into seven colors called the seven spectrum colors.
Primary light colors	They are the light colors that are not produced by mixing two other light colors: (Red - Green - Blue)
Secondary light colors	They are the light colors which are produced by mixing two primary light colors: (Yellow - Cyan - Magenta).
The natural magnet	It is one of the iron ores which is a black rock and is known as magnetite.
The artificial magnet	It is a man-made magnet.

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Magnetic materials	They are materials which are attracted to the magnet (iron - steel).
Non-magnetic materials	They are materials which are not attracted to the magnet (aluminum - copper).
Magnetic poles	The regions of the magnet at which most of the attraction force is concentrated.
The magnetic field	It is a region (space) around a magnet in which the effect of the magnetic force appears.
The magnetic force	It is the ability of the magnet to attract magnetic materials that exist in its field.
The compass	It is a tool that is used to identify the four main geographical directions (North - South - East - West).
The electromagnet	It is a temporary magnet which is made by the effect of electricity. Or it is a device that is used to convert electrical energy into magnetic energy.
Ammeter	A device used to measure electric current intensity.
The dynamo	It is a device that is used to convert the mechanical (kinetic) energy into electrical energy.

2. Importance and uses

Item	Importance and uses
A glass prism	• It separates the visible white light into seven spectrum colors.
White opaque objects	• They reflect all spectrum colors.
Black opaque objects	• They absorb all spectrum colors.
A magnet	• It is used to attract magnetic substances like iron, nickel, steel and cobalt. • It is used in making the electric generator (dynamo) and the compass.
A magnetic compass	• It is used to identify the four main geographical directions.

The electromagnet	• It converts electric energy into magnetic energy. • Making cranes (big-sized winches) to lift heavy iron blocks. • Making many devices such as: a. The electric bell. b. The electric mixer. c. The disc drive. d. The television.
The dynamo (the electric generator)	• It converts the kinetic energy into electric energy: 1– Using a small dynamo as in the bicycle. 2– Using a huge dynamo (electric generator). • It is used to generate large amounts of electricity in electric power stations for lightening cities and operating factories.

3. Give a reason

1. The moon is not considered as a source of light.
   - Because it reflects sunlight that falls on its surface.
2. The moon seems shiny.
   - Because the moon reflects sunlight which falls on its surface.
3. The formation of images by using narrow holes.
   - Due to the traveling of light in straight lines.
4. The formation of shadow when light falls on an opaque body.
   - Due to the traveling of light in straight lines.
5. Clear water and transparent plastic are transparent materials.
   - Because they allow most light to travel through and things can be seen clearly (in full details) behind them.
6. Things can be seen clearly behind transparent materials.
   - Because they allow most light to travel through.
7. Tissue paper is a semi-transparent (translucent) material.
   - Because it allows some light to travel through and things can be seen less clearly behind them, compared to the transparent ones.
8. Carton paper and wood are opaque materials.
   - Because they do not allow light to travel through and things cannot be seen behind them.
9. Things cannot be seen behind wood.
   - Because wood is an opaque material that does not allow light to travel through.

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10. You can see your image across a mirror.
    - Due to the occurrence of the regular reflection, where light rays are reflected in one direction.

11. The pencil appears as if it was broken at the water surface in a transparent glass.
    - Because of light refraction where light speed through air is faster than that through water.

12. Refraction of light rays as soon as they transfer from air to water.
    - Because light speed in air is faster than in water.

13. The formation of the light spectrum.
    - Because on passing of white light through a glass prism, it is separated into seven spectrum colors.

14. White light can be separated.
    - Because white light is made up of seven spectrum colors and when white light passes through a glass prism, it separates into seven spectrum colors.

15. A rainbow is formed in the sky after rain.
    - Because sunlight splits into seven colors when it passes through the drops of rain water where the drops of rain act as a glass prism.

16. A green glass window appears green when a white light strikes it.
    - Because the glass absorbs all the spectrum colors and allows (permits) the green light only to pass through.

17. Transparent and translucent objects appear colored when light passes through.
    - Because they absorb all the spectrum colors and allow (permit) their own color only to transmit through.

18. An apple appears red through a red transparent glass sheet.
    - Because it absorbs all the spectrum colors of light that strike it and reflects the red color only. The reflected red color strikes the red transparent glass sheet and passes through the glass.

19. When white light strikes a transparent green glass ruler, the green color only passes through.
    - Because a transparent green ruler absorbs all light colors and allows the green color only to pass through.

20. An apple appears black through a green transparent glass sheet.
    - Because the green glass sheet does not transmit the reflected red color.

21. The strawberry fruit appears red when white light falls on it.
    - Because it absorbs all the spectrum colors that fall on it and reflects the red light only.

22. A banana fruit seems yellow when sunlight falls on it.
    - Because a banana fruit absorbs all light colors and reflects the yellow color only.
23. White opaque objects appear to be white in color.
    - Because they reflect all the spectrum colors.
24. Black opaque objects appear to be black in color.
    - Because they absorb all the spectrum colors and do not reflect any color.
25. We should wear white clothes in summer.
    - Because white clothes reflect all light colors.
26. It is preferred to wear black clothes in winter.
    - Because black clothes absorb all light colors.
27. Red, green and blue lights are known as "primary light colors".
    - Because they are not produced by mixing any other light colors.
28. Yellow, cyan and magenta colors are known as "secondary light colors".
    - Because each color is produced by mixing two primary light colors.
29. Some materials are known as magnetic materials.
    - Because they are attracted to the magnet.
30. Some materials are known as non-magnetic materials.
    - Because they are not attracted to the magnet.
31. Copper, wood and glass are considered non-magnetic materials, while iron, nickel and cobalt are considered magnetic materials.
    - Because copper, wood and glass are not attracted to the magnet, while iron, nickel and cobalt are attracted to the magnet.
32. The magnet attracts iron nails, but does not attract chalk pieces.
    - Because iron nails are magnetic materials, but chalk pieces are non-magnetic materials.
33. When you put some iron nails next to a magnet, most nails are attracted to the two poles of the magnet.
    - Because the two poles of the magnet have the most powerful force of attraction.
34. Paper clip is a magnetic substance.
    - Because it is attracted to the magnet.
35. Wood and glass are non-magnetic substances.
    - Because they are not attracted to the magnet.

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36. One pole of the magnet is called "north pole (N)", while the other is called "south pole (S)".
    - Because the freely suspended magnet always takes a fixed (North-South) direction. The pole of the magnet which points to the north is called "north pole (N)", while the other one that points to the south is called "south pole (S)".
37. The two north poles repel each other, while the north pole attracts the south pole.
    - Because like magnetic poles repel each other, while unlike magnetic poles attract each other.
38. The compass is used to identify the four main geographical directions.
    - Because its north pole refers to the north direction of the Earth and its south pole refers to the south direction of the Earth.
39. When an electric current flows through a wire that is put beside a compass, its needle deflects.
    - Because the electric current has a magnetic effect where it generates a magnetic field.
40. The magnet which is made by electricity is called electromagnet.
    - Because it changes electric energy into magnetic energy.
41. It is preferable to increase the number of coil turns in the electromagnet.
    - To increase the magnetic force of the electromagnet.
42. In the electromagnet, we have to increase the number of batteries.
    - To increase the intensity of the electric current passing through the coil which increases the magnetic force of the electromagnet.
43. In the electromagnet, we use a battery with high voltage and increase the number of turns in the moving coil.
    - To increase the magnetic force.
44. In the dynamo, we use a strong magnet and increase the number of turns in the moving coils.
    - To increase the electric energy.
45. The deviation of the ammeter's pointer when moving the copper wire between the two poles of magnet.
    - Due to passing of the electric current through the copper wire.
46. The small cylinder in the bicycle's dynamo touches the bicycle's wheel tire.
    - Because when the bicycle moves, the small cylinder turns by touching the bicycle's wheel tire, so the magnet turns inside the coil and the electric current is generated causing the bicycle's bulb light.

4. What happens if ...?

1. You look at a candle light through three partition holes which are on the same straight line with the light of the candle.
   - I can see the candle light because light travels in straight lines.
2. You darken a room and put your hand between a light source and a wall.
   - Shadow is formed as light travels in straight lines.
3. You put a transparent object between a light source and a wall.
   - No shadow is formed.
4. You look at your image through a transparent material.
   - I can see my image across it clearly.
5. You look at your image through frosted glass.
   - I can see my image across less clearly compared to transparent glass.
6. You stand facing a mirror.
   - I can see my image due to the regular light reflection.
7. You look at a pencil inside a glass of water.
   - The pencil appears as if it is broken at the water surface due to light refraction because the speed of light through air is faster than that through water.
8. You let sunlight pass through a triangular prism.
   - White light is separated into seven spectrum colors.
9. The seven colors are mixed with each other.
   - White light is produced.
10. When white light strikes a red apple.
    - It seems red because it absorbs all the spectrum colors that fall on it and reflects the red light only.
11. When white light strikes a yellow glass window.
    - It seems yellow because it absorbs all the spectrum colors which fall on it and allows the yellow light only to pass through.
12. You look at a green apple through a red glass sheet.
    - The apple seems to be black.
13. When white light strikes a banana.
    - The banana absorbs all the spectrum colors and reflects the yellow light only.

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14. When white light strikes a black object.
    - The black object absorbs all the spectrum colors and appears black.
15. Mixing the red and blue lights.
    - The magenta (purple) color is formed.
16. Mixing red and green lights.
    - The yellow color is formed.
17. A strong magnet is put close to a piece of nickel.
    - The piece of nickel is attracted to the magnet.
18. A strong magnet is put close to a piece of wood.
    - The piece of wood is not attracted to the magnet.
19. Paper clips are put near a bar magnet.
    - The two ends of the magnet attract a greater number of the paper clips because the areas of the magnet which have the most powerful force of attraction are the two ends which are called "the two poles".
20. A magnet is placed next to a mixture of iron nails, paper clips, glass, chalk pieces, aluminum.
    - Iron nails and paper clips are attracted to the magnet.
    - Glass, chalk pieces and aluminum are not attracted to the magnet.
21. You scatter some iron filings on a glass sheet, put a strong magnet, then knock on the glass sheet.
    - Iron filings are arranged around the magnet in a regular way and assemble at the two poles of the magnet.
22. A magnet is hung to move freely.
    - One pole of the magnet is directed towards the north direction of the earth, while the other pole is directed towards the south direction of the earth,
23. A north pole of a magnet is put next to a north pole of another one.
    - The two north poles repel each other.
24. A north pole of a magnet is put next to a south pole of another one.
    - The north pole attracts the south pole.
25. An electric current passes through a coil winding around a wrought iron bar.
    - The iron bar changes into a temporary magnet that is called "electromagnet".
26. An electric current passes through a coil winding around a wrought iron bar that is immersed in iron filings.
    - The iron bar attracts iron filings as it becomes an electromagnet.

27. An electric current passes through the coil of the electromagnet of a winch.
    - It attracts iron blocks, then moves to another place.
28. Cutting off the electric current which passes through the coil of the electromagnet of a winch.
    - The electromagnet loses its magnetic force and iron blocks fall.
29. Increasing the number of batteries in an electromagnet.
    - The magnetic force increases.
30. You move a magnet inside the coil.
    - An electric current is generated in the coil.
31. Increasing the number of turns in the moving coil in the dynamo.
    - Increases the produced amount of electricity from the dynamo.
32. Connect a copper wire with the ammeter, then put it between the two poles of a magnet.
    - The pointer of the ammeter does not deflect.
33. Connect a copper wire with the ammeter, then put it between the two poles of a magnet. Then increase the motion of the wire between the two poles of the magnet.
    - The pointer of the ammeter is deflected due to the passing of more electric current.

5. Comparisons

1.

Transparent materials	Semi-transparent (translucent) materials	Opaque materials
• They are the materials that allow most light to travel through and things can be seen clearly (in full details) behind them.	• They are the materials that allow some light to travel through and things can be seen less clearly behind them, compared the transparent ones.	• They are the materials that do not allow light to travel through and things cannot be seen behind them.
Ex.		
• Glass windows. • Air. • Clear water. • Transparent plastic.	• Tissue paper. • Screen doors. • Frosted glass.	• Cardboard. • Wood. • Clay forms. • Foil.

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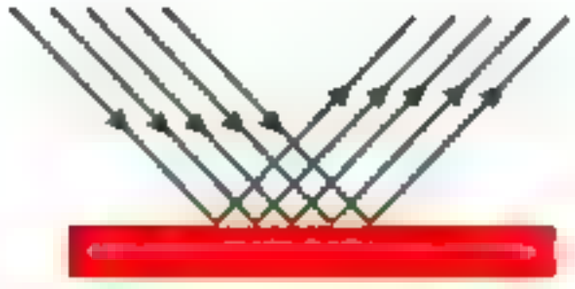
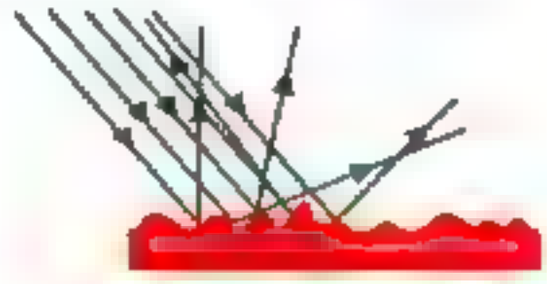
2.

Regular reflection	Irregular reflection
• It is the reflection of light when it falls on a smooth and bright (shiny) surface.	• It is the reflection of light when it falls on a rough surface (containing protrusions and tiny holes).
 A smooth surface	 A rough surface
• Light rays are reflected in one direction.	• Light rays are reflected and scattered in different directions.
Ex.	
Reflection of light when it falls on a plane mirror.	Reflection of light when it falls on a paper.

3.

Seeing colored transparent and translucent objects	Seeing colored opaque objects
• Why does the glass bottle appear to be green? 	• Why does the banana appear to be yellow? 
Explanation:	**Explanation:**
1. When white light strikes the transparent glass bottle as shown, the glass bottle absorbs all the spectrum colors and allows (permits) the **green** light only to pass through.	1. When white light strikes the banana as shown, the banana absorbs all the spectrum colors and reflects the **yellow** light only.
2. As a result, the glass bottle appears to be **green**.	2. As a result, the banana appears to be **yellow**.

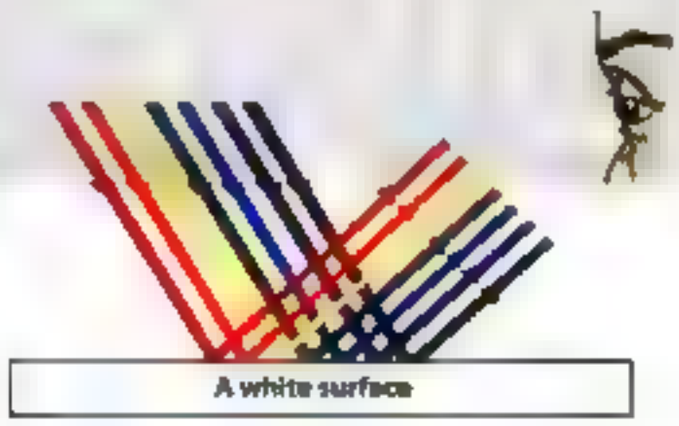
Conclusion:

- Colored transparent and translucent objects have the same colors of light passing through.

Conclusion:

- Colored opaque objects have the same colors of the reflected light.

4.

Seeing white opaque objects	Seeing black opaque objects
• When white light strikes white opaque objects as shown, these objects reflect all the spectrum colors. 	• When white light strikes black opaque objects as shown, these objects absorb all the spectrum colors and do not reflect any color. 
Ex. So, white opaque objects appear to be white (the same color of light that falls on them).	Ex. So, black opaque objects appear to be black.

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5.

Primary light colors	Secondary light colors
• They are the light colors that are not produced by mixing two other light colors.	• They are light colors that are produced by mixing two primary light colors.
Ex. Red, green and blue.	Ex. Yellow, magenta and cyan.

6.

Magnetic materials	Non-magnetic materials
• They are the materials which are attracted to the magnet.	• They are the materials which are not attracted to the magnet.
Ex. Iron – steel – cobalt – nickel.	Ex. Paper – glass – wood – plastic – chalk – aluminum – copper.

7.

Electromagnet	Dynamo
Structure: • A copper wire coiling around a bar of wrought iron and this wire is connected to a battery. • It converts electric energy into magnetic energy.	**Structure:** • A copper coil and a magnet. • It converts the mechanical energy into electric energy.
Uses: • It is used to make big-sized winches (cranes) to lift heavy iron blocks in factories. • Making many devices such as: a. The electric bell. b. The electric mixer. c. The disc drive. d. The television.	**Uses:** • It generates a large amount of electricity that is used for lightening cities and operating factories.

6. Main points

1. The sun is the main light source on the earth's surface.
2. The light energy which can be seen is called the visible spectrum.
3. Lamps, candles and kerosene lamps are from the artificial sources of light.
4. Traveling of light in straight lines causes some phenomena such as:
   (a) The formation of images by using narrow holes.
   (b) The formation of shadow.
5. The idea of the photographic camera is based on the idea of the formation of images by using narrow holes.
6. As an object approaches a light source, the shadow area increases and vice versa. Therefore, the nearer an object to a light source, the bigger the object's shadow becomes.
7. Mixing the spectrum colors produces the visible white light.
8. The visible white light is made up of seven spectrum colors.
9. Colored transparent and translucent objects have the same colors of the transmitted light through.
10. Colored opaque objects have the same colors of light they reflect.
11. An opaque object is seen in its original color when you see it through a transparent object that has the same color.
12. The materials that are attracted to the magnet are called "magnetic materials".
13. The materials that are not attracted to the magnet are called "non-magnetic materials".
14. The areas of the magnet which have the most powerful force of attraction are the two ends which are called "the two poles of the magnet".
15. To differentiate between the two poles of the magnet, the north pole is colored in red, while the south pole is colored in blue.
16. Like magnetic poles repel each other, while unlike magnetic poles attract each other.
17. A magnet loses its magnetic properties by heating or hammering.
18. The magnetic field around the magnet has a regular shape.
19. The most powerful magnetic force of a magnet is at its poles.
20. The magnetic needle of the compass refers to the north and south directions of the earth.

Remember what you have learnt in this unit through the following points:

① Definitions
② Give a reason
③ What happens if ...?
④ Comparisons
⑤ Diagrams
⑥ Main points

Unit 2
Mixtures

1. Definitions

Concept	Definition
A pure substance	It is the substance that is made up of only one type of identical particles.
A mixture	It is the substance that consists of more than one type of particles.
A solid-solid mixture	The mixture that consists of two or more different solid materials.
A liquid-liquid mixture	The mixture that consists of two or more different liquids.
A solid-liquid mixture	The mixture that consists of solid and liquid matter.
A gaseous-gaseous mixture	The mixture that consists of different gases.
A gaseous-liquid mixture	The mixture that consists of gas and liquid matter.
Homogeneous mixtures	Mixtures whose components cannot be distinguished (milk).
Heterogeneous mixtures	Mixtures whose components can be distinguished (sand and water mixture).
A solvent	It is the substance in which a solute disappears (dissolves).
A solute	It is the substance which dissolves in the solvent.
A solution	It is a homogeneous mixture in which the solute breaks down into its most basic particles that spread throughout the solvent.
Solubility process	It is the process by which a solute dissolves in a solvent leading to the disappearance of the solute.
Soluble substance	It is the substance that dissolves in a solvent.
Insoluble substance	It is the substance that does not dissolve in a solvent.
Suspension	It is a heterogeneous liquid mixture in which the particles of the solute are suspended through the solvent and can be separated by filtration process.

2. Give a reason

1. Both distilled water and salt are pure substances.
   - Because each one consists of only one type of identical particles.
2. Milk and tomato sauce are mixtures.
   - Because each one consists of more than one type of particles.
3. Concrete is considered a mixture.
   - Because it consists of more than one type of particles.

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4. Mineral water is considered a mixture.
   - Because it consists of more than one type of particles.
5. Air is considered a gaseous-gaseous mixture.
   - Because it consists of different gases such as nitrogen, oxygen and carbon dioxide.
6. Table salt can be separated from sea water.
   - Because by evaporation process of sea water, water evaporates and salt remains.
7. Iron filings can be separated easily from sand.
   - Because a magnet attracts iron filings and separates them from sand.
8. A heterogeneous mixture is formed by adding sand to water.
   - Because sand is an insoluble substance in water.
9. A solution is a type of mixture.
   - Because it consists of more than one type of particles.
10. Sea water and sugary solutions are homogeneous liquid mixtures.
    - Because the components of each of them cannot be distinguished from each other.
11. Chalk in water is a heterogeneous mixture.
    - Because the particles of chalk can be distinguished from water.
12. Water is considered a common solvent.
    - Because a lot of solid materials dissolve in it.
13. The solubility speed depends on the temperature of the solution.
    - Because when the temperature of the solution increases, the time of solubility decreases.
14. Dissolving sodium chloride in water is faster than dissolving sodium carbonate in the same amount of water.
    - Because the solubility speed depends on the kind of the solute.
15. Dissolving 10 g of sodium chloride in 500 ml of water is faster than dissolving 100 g of sodium chloride in the same amount of water.
    - Because when the amount of the solute increases, the solubility speed decreases.
16. Dissolving sugar in hot water is faster than in cold water.
    - Because when the temperature increases, the solubility speed increases.
17. Powdered sugar dissolves in water faster than cubes of sugar.
    - Because when the surface area of sugar increases, the solubility increases.
18. The solubility speed depends on the temperature of the solution.
    - Because when the temperature of the solution increases, the speed of solubility increases.
19. A large amount of salt hardly and slowly dissolves in small amounts of water.
    - Because when the amount of solute increases, the solubility time increases.

3. What happens if ...?

1. Stirring an amount of salt in water.
   - A homogeneous mixture of salty water is formed.
2. Adding an amount of oil to an amount of water.
   - Oil does not mix with water and forms a layer over it (liquid-liquid mixture).
3. Grinding pepper with salt.
   - A solid-solid mixture is formed.
4. Carbon dioxide gas passes through a sugary solution.
   - Carbon dioxide dissolves in the sugary solution producing soda water (a gaseous-liquid mixture).
5. Stirring a mixture of sugar and water.
   - The solubility speed increases.
6. Salty water is left for a long time.
   - Water evaporates leaving the salt.
7. Putting a magnet next to a mixture of iron filings and flour.
   - Iron filings are attracted to the magnet.
8. Adding sand to water.
   - Sand is an insoluble substance in water, so a heterogeneous mixture is formed and it is called a suspension.
9. Stirring two unequal amounts of salt in two beakers that contain equal amounts of water.
   - The solubility time of salt in the beaker that contains a large amount of water decreases, while the other beaker increases.
10. The amount of a solvent increases.
    - The solubility speed increases, while solubility time decreases.
11. The amount of a solute increases.
    - The solubility speed decreases, while solubility time increases.
12. The temperature of a solvent increases.
    - The solubility speed increases.
13. The temperature of a solvent decreases.
    - The solubility speed decreases (solubility time increases).

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4. Comparisons

1.

Pure substance	Mixture	Solution
• It is the substance that consists of only one type of identical particles.	• It is the substance that consists of more than one type of particles.	• It is a type of mixture that consists of a solute that dissolves (disappears) in a solvent.
Ex. Baking soda.	Fruit salad.	Salty water.

2.

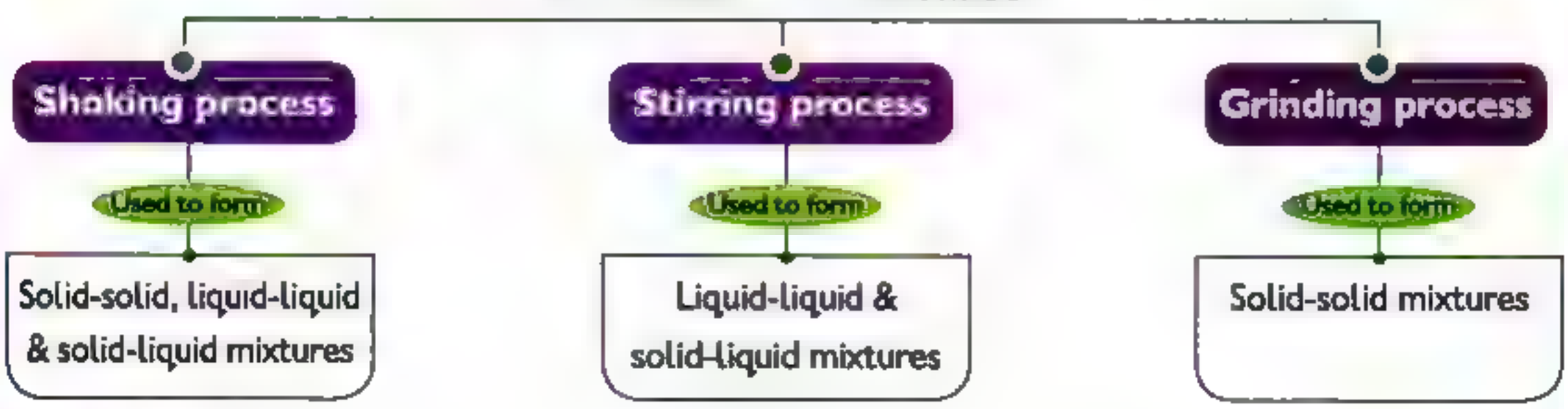
Homogeneous mixture	Heterogeneous mixture
• Its components cannot be distinguished from each other.	• Its components can be distinguished from each other.
Ex. – Salty water. – Sugary solutions.	– Sand in water. – Mud in water.

3.

Solvent	Solute
• It is the liquid substance in which a solute dissolves.	• It is the substance that dissolves (disappears) in a solvent.
Ex. – Water in salty solutions. – Alcohol – benzene.	– Salt in salty water. – Sugar in sugary solutions.

5. Diagrams

Formation of mixtures



Unit 2
Mixtures

Separation of mixtures

A magnet (the magnetic attraction)	A filter paper (filtration process)	Evaporation process	Separating funnel
Used to separate	Used to separate	Used to separate	Used to separate
Solid-solid mixtures containing magnetic materials.	Solid materials that are insoluble in water.	Some soluble solid materials from water.	Heterogeneous liquid mixtures.
Ex. Iron filings from sand.	Ex. Sand from water.	Ex. Salt from sea water.	Ex. Oil-water mixtures.

Ex.

Substances	Mixtures	Methods of separation
Iron filings	Iron-wood mixtures	A magnet
Salt	Salty solutions	Evaporation process
Oil	Oil-water mixtures	Separating funnel
Sand	Water-sand mixtures	A filter paper (Filtration process)

6. Main points

1. Mixtures consist of more than one type of particles.
2. Properties of mixtures:
   - Their components do not react with each other and can be separated easily.
   - Each component keeps its own properties.
   - Their components can be mixed by any ratio.
3. Methods of formation of mixtures:

Shaking — Stirring — Grinding

4. Methods of separation of mixtures:

Magnetic attraction — Filtration process — Evaporation process — Separating funnel

5. The factors that affect solubility process:
   - Quantity of a solvent and a solute.
   - Stirring.
   - Temperature.
   - The kind of the solute.

Unit 3

ENVIRONMENTAL BALANCE

Remember what you have learnt in this unit through the following points:

① Definitions
② Importance and uses
③ Give a reason
④ What happens if ...?
⑤ Comparisons
⑥ Diagrams
⑦ Important labels
⑧ Main points

Unit 3
Environmental Balance

1. Definitions

Concept	Definition
Predation	It is a temporary food relationship that ends by the devouring of the prey or a part of it.
A predator	The animal which devours another animal.
A prey	It is the devoured animal.
Camouflage	It is a phenomenon in which a living organism can change its color to simulate the colors of its surrounding environment to hide from enemies.
Mimicry	It is a phenomenon in which harmless living organisms imitate other kinds of harmful or poisonous living organisms to frighten their enemies.
Symbiosis	It is a common food relationship between two different types of living organisms where one benefits from the other and does not harm it, while the other may benefit or is harmed.
Mutualism	It is a food relationship between two living organisms and both get benefits.
Commensalism	It is a superficial food relationship between two living organisms where one of them benefits from the other, while the other neither gets benefit nor is harmed.
Parasitism	It is a food relationship between two different kinds of living organisms where one benefits from the other, while the other one is harmed.
The parasite	The living organism in parasitism which gets benefits from the other.
The host	The living organism in parasitism which is harmed.
External parasitism	It is a food relationship in which the parasite lives externally on the host's body and feeds by sucking blood of the host and conveys diseases to it.

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Internal parasitism	It is a food relationship in which the parasite lives internally inside the host's body and shares the host's digested food or feeds on its tissues and cells.
Saprophytism	It is a food relationship in which the saprophytes (decomposers) get their food by decomposing food remains or bodies of dead organisms.
The ecosystem	It is a natural area that contains some living organisms (such as plants and animals) and non-living things (such as air - water - soil).
The environmental balance	It is the balance among the components of the ecosystem.
The environmental imbalance	It is any disturbance that affects the environmental balance.

2. Importance and uses

1. Predation relationship:

1. It organizes the numbers of prey populations to keep the environmental balance.
2. Predators help preys to get rid of weak or sick members and allow strong ones in the prey populations to reproduce.
3. If there are no predators, there will be an increase in the numbers of preys, no sufficient food, competition and death of preys or preys become weak and feeble with diseases.

2. Saprophytism relationship (bacteria and fungi are decomposers):

1. They decompose bodies of dead organisms.
2. They complete the food chains and webs.
3. They recycle the chemical elements within the ecosystem such as carbon, nitrogen, and sulphur, so new living organisms get these elements.
4. They help in some industries such as:
    a. **Food industry:** in making cheese, yoghurt, vinegar, bread and alcohol.
    b. **Drugs industry:** such as antibiotics.
    c. **Leather tanning industry.**

3. Give a reason

1. Living organisms use defensive weapons, proper adaptations and mimicry.
   - Because they compete with each other to get their food.
2. Predation is a temporary relationship.
   - Because it ends by devouring of the prey or a part of it
3. Predation is less common in the plant world.
   - Because plants are autotrophic organisms that can make their food by photosynthesis.
4. Predation is more common in the animal world.
   - Because animals get food from bodies of other living organisms.
5. The relationship between a lion and a deer is predation.
   - Because the lion devours the deer.
6. Plants are autotrophic organisms.
   - Because they can make their own food by photosynthesis using simple substances in the presence of sunlight.
7. Some plants cannot make proteins although they can perform photosynthesis to produce carbohydrates.
   - Because they cannot absorb some compounds from soil to make proteins.
8. Drosera is an insectivorous plant.
   - Because it feeds on insects to get the required elements for making proteins.
9. Some animals have the ability for camouflage.
   - To hide from enemies as they simulate the color of the surrounding environment.
10. A cuttlefish can hide from enemies.
    - Because it ejects a black fluid in water when it is attacked by enemies to hide from them.
11. A chameleon can hide from enemies.
    - It changes its color to simulate the color of its surrounding environment.
12. Some bees look like wasps because of the lines on their bodies.
    - To frighten their enemies which are afraid of wasps.
13. A butterfly stands on a tree with a similar color.
    - To hide from enemies by camouflage.
14. Some frogs can change their colors.

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- As camouflage; to hide from enemies.

15. A chameleon simulates the color of its surrounding environment.
    - As camouflage; to hide from enemies.
16. The cuttlefish ejects a black colored fluid in the surrounding water when it is attacked by enemies.
    - As camouflage; to hide from them.
17. The relationship between nodular bacteria and legumes is mutualism.
    - Nodular bacteria provide the leguminous plants with nitrogen in an inorganic form, while leguminous plants provide bacteria with sugar.
18. There is a commensalism relationship between the sponge and tiny aquatic living organisms.
    - Because tiny aquatic organisms get food and shelter from canals and fissures found in the sponge, while the sponge neither benefits nor is harmed from these living organisms.
19. The parasitism relationship differs from the predation relationship.
    - Because the parasite depends on the host completely to get food causing its weakness, but does not kill it like predators which kill their preys.
20. Saprophytic organisms are decomposers.
    - Because they get food by decomposing food remains or dead bodies.
21. Bread mold, mushroom and penicillium fungi are saprophytes.
    - Because they get their food by decomposing food remains or bodies of dead organisms.
22. Host death is a loss for the parasite.
    - Because the parasite will lose its main source of food and shelter.
23. Lice, bugs, mosquitoes and ticks are external parasites.
    - Because they live on a host's body and feed by sucking its blood.
24. Tape, ascaris, filarial, bilharzia and liver worms are internal parasites.
    - Because they live in a host's body and share its digested food or feed on its tissues and cells.
25. Parasitism causes the weakness of the host.
    - Because the parasite depends completely on the host to get its food causing weakness of the host.
26. The plants depend on the soil.
    - To absorb water to make food by photosynthesis.

27. Some animals depend on plants to get food directly and indirectly.
    - Because some animals are herbivores which feed on plants directly and others are carnivores which feed on animals which feed on plants.

28. The change in natural circumstances causes an environmental imbalance.
    - Because it causes the disappearance of some organisms and the appearance of other organisms.

29. A competition may appear among prey populations in the ecosystem.
    - Due to insufficient food resources for preys.

30. Predators are useful for prey populations.
    - Because they help preys to get rid of weak or sick members and let the strong ones reproduce adding strong members to the populations.

31. The predation relationship plays an important role in keeping a balance within the ecosystem.
    - Because predation organizes the numbers of prey populations.

32. Saprophytic organisms are guards of the nature.
    - Because they get rid of dead bodies and recycle chemical elements such as carbon, nitrogen and sulphur found in these bodies back to the environment to be used by other organisms.

33. Dinosaurs become extinct in ancient eras.
    - Due to the change in the natural conditions of their ecosystem.

4. What happens if ...?

1. There is no food in the environment.
    - Death of all living organisms.
2. A cuttlefish (sepia) is attacked by enemies.
    - It ejects a black fluid in water as camouflage.
3. A chameleon is attacked by enemies.
    - It simulates the color of its surrounding environment.
4. Leguminous plants have no nodular bacteria in their roots.
    - They cannot get nitrogen in an inorganic form.
5. A frog is attacked by enemies.
    - It changes its color.

General & Final Revision

6. A parasite lives externally on the host's body.
   - It sucks its blood and may convey a disease to the host.
7. A mosquito stands on your skin.
   - It will suck your blood and may convey malaria disease to you.
8. You splash some water drops on a slice of bread and leave it for two days.
   - A dark green layer is formed on the bread so the bread changes into rotten bread.
9. Introducing rabbits to an island with no natural enemies.
   - The number of rabbits increases, so the food resources become insufficient for them and this leads to competition and death.
10. Cutting down trees.
    - A disturbance in the environment occurs.
11. Killing American hawks.
    - Spreading of rats with loss of crops.
12. Natural changes take place within the ecosystem.
    - The disappearance of some organisms, the appearance of other organisms and the environmental imbalance.
13. An environmental imbalance takes place for a short or a long time.
    - A new environmental balance will occur.
14. There are no predators.
    - The number of preys increases with insufficient food resources leading to competition and death.
15. Absence of preys in the ecosystem.
    - The environmental imbalance will occur.
16. Preys do not find food and shelter in the ecosystem.
    - Competition and death will occur.
17. Saprophytes disappear from nature.
    - The earth will be covered by wastes, dead bodies and food remains.
18. Chemical elements are not recycled by saprophytic organisms.
    - Other living organisms cannot get benefits from these elements.

5. Comparisons

1.

P.O.C.	Predation	Parasitism
Definition	• A temporary food relationship which ends by devouring of the prey or a part of it.	• A food relationship between two different kinds of living organisms where one benefits from the other, while the other one is harmed.
Harms	• The prey is killed.	• The host becomes weak.
Ex.	The relation between a lion and a deer.	The relation between a flarial worm and man.

2.

P.O.C.	Commensalism	Parasitism
Definition	• A superficial food relationship between two living organisms where one of them benefits from the other, while the other nether gets benefit nor is harmed.	• A food relationship between two different kinds of living organisms where one benefits from the other, while the other one is harmed.
Ex.	The relation between the sponge and tiny aquatic organisms.	The relation between a bilharzia worm and man.

3.

P.O.C.	Parasitism	Saprophytism
Definition	• A food relationship between two different kinds of living organisms where one benefits from the other, while the other one is harmed.	• A food relationship in which saprophytes get their food by decomposing food remains or bodies of dead organisms.
Ex.	Lice – tapeworms – bugs	Mushroom - bread mold and penicillium fungus

4.

P.O.C.	External parasitism	Internal parasitism
The place where the parasite lives	• On a host's body.	• In a host's body.
Food	• Sucking a host's blood.	• Sharing a host's food or feeding on its tissues and cells.
Ex.	Mosquitoes – lice – bugs	(Bilharzia–tape-ascaris worms

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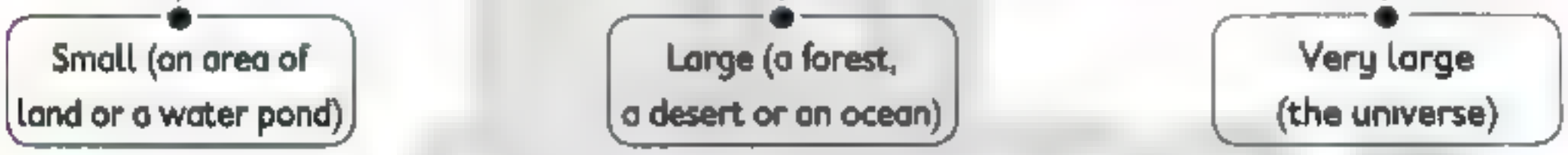
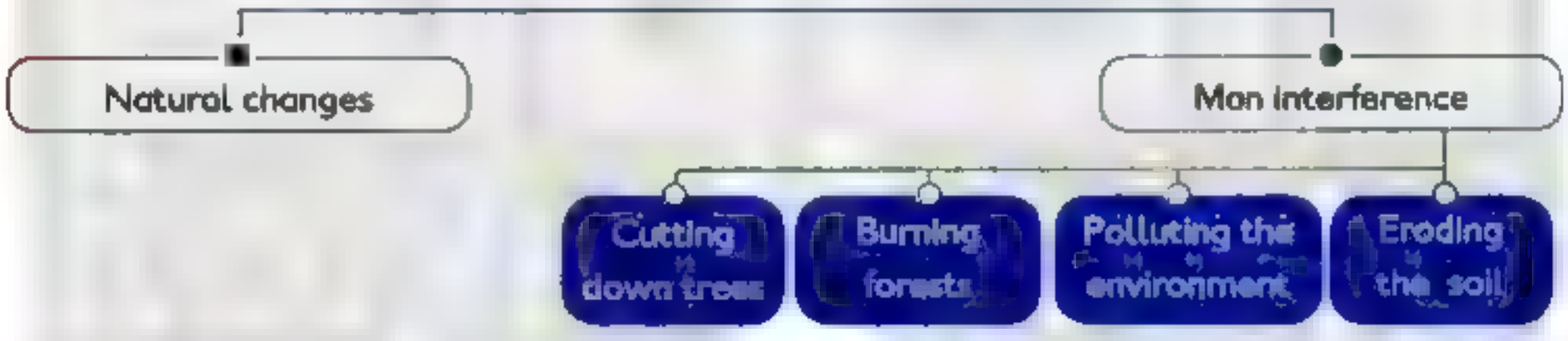
6. Diagrams

Food relationships

The ecosystem



Factors that disturb the environmental balance



Factors that keep the environmental balance

7. Important labels

1. Some food relationships:

The relation between	The type
A lion and a deer	• Predation
Drosera and an insect	• Predation
A wolf and a rabbit	• Predation
A cat and a rat	• Predation
Nodular bacteria and leguminous plants	• Symbiosis: mutualism
The sponge and tiny aquatic organisms	• Symbiosis: commensalism
Penicillium fungus and orange fruit	• Saprophytism
Bread mold and bread	• Saprophytism
Mosquitoes and man	• Symbiosis: external parasitism
Lice and man	• Symbiosis: external parasitism
Fleas and man	• Symbiosis: external parasitism
Jawless lamprey and fish	• Symbiosis: external parasitism
Bugs and a host	• Symbiosis: external parasitism
Lice and a host	• Symbiosis: external parasitism
Liver worm and its host	• Symbiosis: internal parasitism
Filarial worm and its host	• Symbiosis: internal parasitism
Ascaris worm and its host	• Symbiosis: internal parasitism
Bilharzia worm and its host	• Symbiosis: internal parasitism

2.

The phenomenon	The organism
Camouflage	• A butterfly stands on a tree with a similar color.
Camouflage	• A frog changes its color to suit its environment.
Camouflage	• A chameleon simulates its color to suit its environment.
Camouflage	• A cuttlefish ejects a black fluid in water.
Mimicry	• Some bees look like wasps.

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3.

The parasite	Its type	The disease
Filarial worms	• Internal	• Elephantiasis
Mosquitoes	• External	• Malaria
Ascaris worms	• Internal	• Anemia
Fleas	• External	• Smallpox
Bilharzia worms	• Internal	• Bilharziasis

8. Main points

1. The sun is the main energy source for living organisms.
2. Predation is between a predator and a prey.
3. Drosera, dionaea and halophila are insectivorous plants.
4. Camouflage and mimicry are forms of self-defence against predation.
5. Symbiosis includes mutualism, commensalism and saprophytism.
6. Mushroom, bread mold and penicillium fungi are saprophytes (decomposers).
7. The ecosystem is a natural area that contains living organisms and non-living things.
8. The environmental balance is the balance among the components of the ecosystem.
9. Factors that disturb the environmental balance:
   a. Natural changes.
   b. Man's interference such as cutting down trees, burning forests, polluting the environment and eroding the soil.
10. Predation and saprophytism keep the environmental balance.

Unit 1 Energy

Lesson 1 Light

(Guide Answers P. 16)

Worksheet (1)

(Tota marks: 20)

1 A. Complete the following sentences:

1. Moonlight is the reflection of ..... that falls on its surface.
2. The formation of shadow is an evidence that light travels in ..... lines.
3. The material through which light can pass is called .....
4. Light can easily pass through ..... and ..... materials.
5. Carton paper is an example of ..... materials.
6. The image formed through narrow holes is ..... and .....

B. What is meant by...?

1. The visible spectrum.

2. Shadow.

3. Translucent materials.

2 A. Choose the correct answer:

1. The characteristics of the object's image that is formed through narrow holes are .....

   a. minimized and inverted b. enlarged and inverted

   c. minimized and upright d. enlarged and upright

2. The nearer the object to a light source, the ..... the shadow.

   a. smaller b. bigger c. more fainted d. all the previous answers

3. The materials which things can be clearly seen behind are called .....

   a. translucent materials b. opaque materials

   c. transparent materials d. all the previous answers

Worksheets & Exams

4. The bouncing of light rays when they fall on a plane mirror is known as .....
   a. irregular reflection
   b. irregular refraction
   c. regular reflection
   d. regular refraction

B. What happens when...?

1. Sunlight passes through water droplets during rain falling.

2. You look at a mirror.

3 A. Write the scientific term for each of the following:

1. The light energy that can be seen. (.....)
2. The materials which light cannot pass through. (.....)
3. The materials which allow some light to pass through and we can see objects behind them less clearly. (.....)
4. The reflection of light when it falls on a smooth and shiny surface. (.....)
5. The main source of light on the earth's surface. (.....)

B. Give a reason for each of the following:

1. The image formed through narrow holes is inverted.

2. The moon seems luminous.

3. Glass window is a transparent material.

4 Look at the opposite figures, then answer:

Fig. (1)

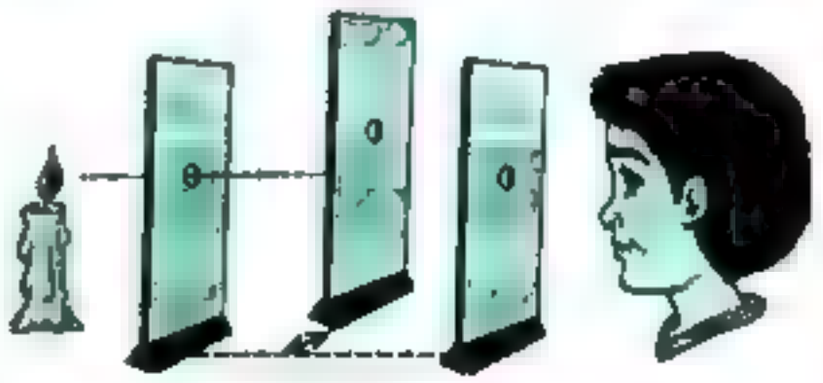


Fig. (2)

1. Can you see the light of the candle in Fig. (1)?
2. Can you see the light of the candle in Fig. (2)?
3. General conclusion:

Worksheet (2)

(Total marks: 20)

1 A. Complete the following sentences:

1. The nearer the object to the source of light, the ..... shadow.
2. ..... materials allow some light to pass through, but ..... materials do not allow light to pass through.
3. The presence of ..... and ..... is necessary for light reflection.
4. The types of reflection are ..... and .....
5. We see ..... in the sky during rain.

B. Give a reason for each of the following:

1. We cannot see in the dark.

2. The formation of shadow.

3. White light can be separated.

2 A. Write the scientific term for each of the following:

1. The darkened area that is formed when light falls on opaque objects. (.....)
2. The material which allows light to pass through and objects can be seen clearly behind. (.....)
3. The going back of light when it falls on a shiny surface. (.....)
4. The reflection of light when it falls on a rough surface. (.....)
5. Seven spectrum colors which appear in the sky after rainfall. (.....)

B. Choose from column (B) what suits in column (A):

(A)	(B)
1. Light	a. is an opaque material.
2. Shadow	b. separates light into seven colors.
3. Glass	c. is a transparent material.
4. Cardboard	d. propagates in straight lines.
5. Prism	e. reflects sunlight.
	f. is a dark area formed behind a body exposed to light.

1. ..... 2. ..... 3. ..... 4. ..... 5. .....

Worksheets & Exams

3 A. Put (✓) or (X) and correct the wrong ones:

1. Light propagates in straight lines. ( )
2. The image formed through narrow holes is always upright. ( )
3. The formation of shadow shows that light travels in curved lines. ( )
4. Carton is an opaque material and light can pass through. ( )
5. A spoon appears broken when it is placed in a glass of water due to reflection of light. ( )

B. What is meant by...?

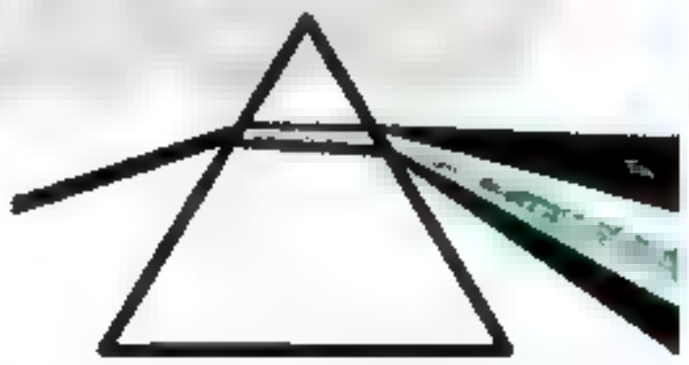
1. A semi-transparent material.
2. Regular reflection.
3. Light reflection.
4. Opaque material.

C. Give a reason for each of the following:

1. The pencil is seen broken in water.
2. Appearance of rainbow in the sky during rainfall.

4 A. Look at the opposite figure, then answer:

1. This figure shows the ..... of white light into ..... by a glass prism.
2. What happens when these seven colors accumulate with each other?
3. What is your conclusion?



B. What happens when?

1. Light rays fall on a rough surface.
2. Light rays transfer from a transparent medium to another one.
3. Put your hand between a wall and a source of light.

Lesson 2 Seeing colored objects

(Guide Answers P. 16)

Worksheet (3)

(Total marks: 20)

1 A. Complete the following sentences:

1. Colored transparent and translucent objects have the same colors of the color which ..... through it.
2. When white light strikes a red apple, it absorbs all the spectrum colors and reflects ..... light only.
3. Yellow color is formed by mixing ..... and ..... colors.
4. As the light falls on green grass, the grass absorbs ..... colors except the ..... color.

B. Put (✓) or (✗) in front of the following statements and correct the wrong ones:

1. When white light strikes a red rose, it reflects the white color. ( )
2. An object seems white since it reflects all the colors which the white light is made up of. ( )
3. If you look at a yellow banana through a green glass sheet, it seems black. ( )
4. Transparent objects have the same color of the light that passes through. ( )

2 A. Choose the correct answer:

1. Mixing all the spectrum colors together produces the ..... light.
   a. white b. yellow c. black d. red
2. The strawberry fruit seems red because it ..... the red color only.
   a. refracts b. absorbs c. transmits d. reflects
3. The apple seems to be ..... when you look at it through a transparent green glass sheet.
   a. red b. black c. yellow d. green

Worksheets & Exams

B. What happens when...?

1. Sunlight falls on a black object.

2. Red light strikes a black surface.

3. White light falls on a green window.

3 A. Write the scientific term for each of the following:

1. The light which is produced by mixing the seven spectrum colors. (.....)
2. Objects that can be seen with the color of their reflected light. (.....)
3. The seven colors of light which sunlight is made up of. (.....)
4. The objects that absorb all light colors when white light falls on them. (.....)

B. Give a reason for each of the following:

1. A green glass window appears green when a white light falls on it.

2. A banana fruit appears yellow when sunlight falls on it.

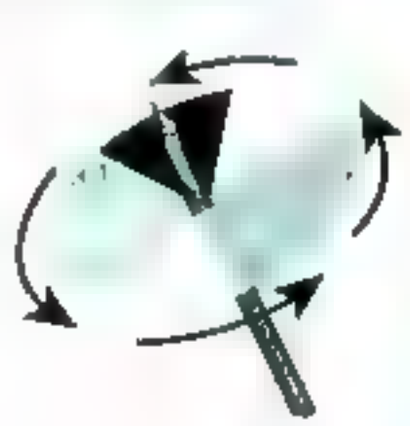
4 A. Compare between...:

White opaque objects	Black opaque objects
.....	.....
.....	.....

B. Look at the opposite figure, then answer:

1. What happens when you rotate this disk quickly?

2. What is your conclusion?



Worksheet (4)

(Total marks: 20)

1 A. Complete the following sentences:

1. Red light + green light + blue light = ...
2. If the seven spectrum colors are mixed together, they produce ..... .
3. ..... reflects its own light only, while ..... allows its own color only to pass through.
4. Red, green and blue are called ..... colors.

B. What happens when...?

1. Sunlight passes through a glass prism.

2. Mixing red and green lights.

3. A green light strikes a white ball.

2 A. Choose the correct answer:

1. ..... reflect all light colors.
   a. White opaque objects b. Black opaque objects c. Yellow opaque objects
2. The black board ..... all light colors.
   a. absorbs b. reflects c. refracts
3. All the following lights are secondary light colors except .....
   a. magenta b. cyan c. green
4. ..... are among the secondary light colors.
   a. Red and green b. Red and cyan c. Cyan and yellow
5. Mixing ..... lights produces the magenta light.
   a. red and green b. red and blue c. red and yellow

B. Look at the opposite figures, then complete:

1. The two opposite figures represent two types of light ..... .
2. Figure (a) represents ..... .
3. Figure (b) represents ..... .

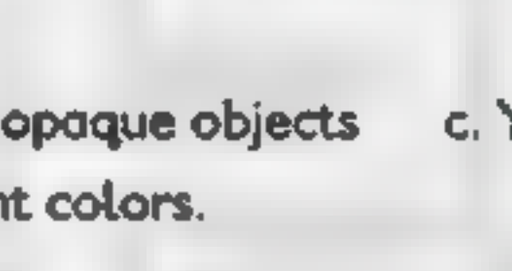


Fig. (a)

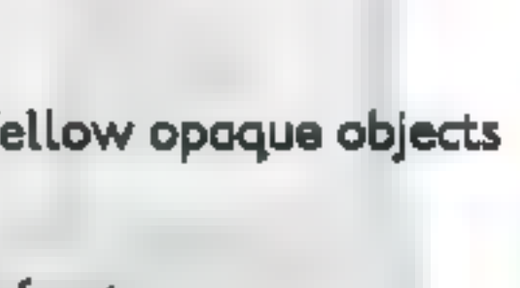


Fig. (b)

Worksheets & Exams

C. Choose from column (B) what suits in column (A):

(A)	(B)
1. Yellow	a. is produced by mixing the red and blue lights.
2. Red	b. is produced by mixing the red and green lights.
3. Cyan	c. is produced by mixing the green and blue lights.
4. Magenta	d. is produced by mixing the primary light colors.
5. White	e. is known as a primary light color.
	f. is produced by mixing the secondory light colors.

1. ..... 2. ..... 3. ..... 4. ..... 5. .....

3 A. Put (✓) in front of the right statement and (✗) in front of the wrong one and correct the wrong ones:

1. The glass prism separates the white light into 10 colors. ( )
2. Mixing the seven light colors gives red light. ( )
3. Transparent objects have the same color of light that passes through. ( )
4. An object seems white because it reflects all light colors. ( )
5. Mixing yellow, green and blue gives white light. ( )

B. What is meant by...?

1. Primary light colors.
2. Secondary light colors.

4 A. Give a reason for each of the following:

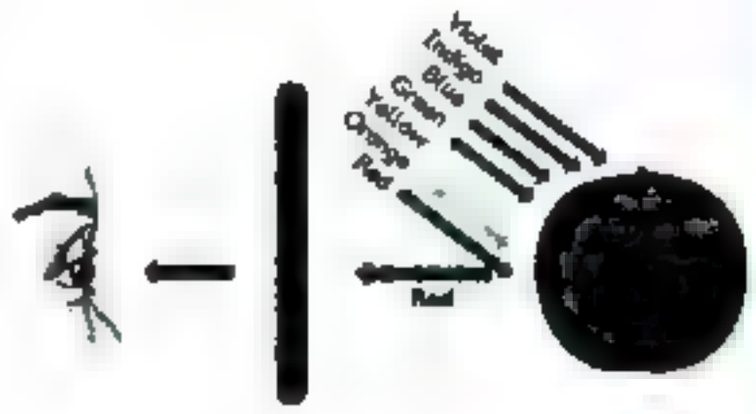
1. We see a white paper as it is.

2. The blackboard appears black.

B. Look at the opposite figure, then answer:

1. The apple appears to be ..... behind the glass sheet.
2. What happens when we replace the red sheet with a green one?

3. The light colors that fall on the apple are called ..... .



Lesson 3 Magnetism

(Guide Answers P. 17)

Worksheet (5)

(Total marks: 20)

1 A. Complete the following sentences:

1. Ancient Greeks discovered black rocks in a region called ..... and these rocks attract materials which are made of ..... .
2. Materials can be divided into ..... and ..... due to their magnetic abilities.
3. The magnet's pole that always refers to the north direction of the Earth is called ..... .
4. The magnet has the most powerful force of attraction at its ..... .
5. Like poles ..... each other, whereas unlike poles ..... each other.

B. What is meant by...?

1. The natural magnet.
2. Magnetic materials.
3. Magnetic field.

2 A. Choose the correct answer:

1. The black iron ore is known as ..... .
   a. the magnetic field b. the natural magnet
   c. the magnetic force d. magnetic materials
2. The materials that are attracted to the magnet are called ..... .
   a. the magnetic field b. the magnetic force
   c. the magnetic compass d. the magnetic materials
3. When a magnet is hung freely, its south pole is directed towards the ..... .
   a. north b. south c. east d. west
4. When you place a magnet near some paper clips, ...
   a the clips are attracted to the two poles of the magnet
   b the clips are attracted to the south pole of the magnet
   c. the clips are attracted to the north pole of the magnet
   d. the clips are not attracted to the poles of the magnet

Worksheets & Exams

5. All the following are magnetic materials except _____.
   a. iron b. steel c. wood d. cobalt

B. Mention the properties of the magnet.

3 A. What happens if...?

1. You fix a magnetic needle on a piece of cork, then put it in a basin containing water.

2. A magnet is hung to move freely.

3. You place a magnet near some iron paper clips and copper wires.

B. Correct the underlined words:

1. Magnetite is an artificial magnet.
2. A natural magnet is one of the iron ores known as cobalt.
3. The materials that are attracted to a magnet are electric materials.
4. Aluminum gets attracted to the magnet.

4 A. Which of the following is a magnetic substance and which is a non-magnetic substance?

(plastic – copper – iron nails – glass – pins – wood – aluminum – gold – paper clips – iron car)

Magnetic substances	Non-magnetic substances

B. Give a reason for each of the following:

1. Some materials are called magnetic materials.

2. When you place some iron nails near a magnet, most nails are attracted to the two poles.

Worksheet (6)

(Total marks: 20)

1 A. Put (✓) in front of the right statement and (✗) in front of the wrong one:

1. Like magnetic poles repel each other, but unlike magnetic poles attract each other. ( )
2. The magnetic field is the space surrounding the magnet where the magnetic force appears. ( )
3. The magnetic force is a visible force. ( )
4. The magnetized needle is the basic idea of making the compass. ( )

B. What happens when ...?

1. You approach the north pole of a magnet close to the south pole of another magnet.
2. You put the north pole of a magnet close to the north pole of another magnet.

2 A. Write the scientific term for each of the following:

1. The space around a magnet where the magnetic force appears. (.....)
2. The pole of the magnet that is attracted to the north pole of another magnet. (.....)
3. The object that consists of a small light magnetic needle that can spin freely around a fixed axis. (.....)
4. The force by which a magnet attracts some materiols. (.....)
5. The set that is used for locating the four main geographical directions. (.....)

Worksheets & Exams

B. Give a reason for each of the following:

1. Steel and cobalt are attracted to the magnet.

2. The magnet attracts metallic paper clips, but does not attract copper wires.

3 A. What is meant by ...?

1. The poles of magnet.

2. Non-magnetic materials.

3. The magnetic force.

B. You have two pieces of metals, one is made of aluminum and the other is made of iron. How can you identify them?

4 A. Choose from column (B) what suits in column (A):

(A)	(B)
1. The artificial magnet	a. is used to identify the four main geographical directions.
2. The magnetic field	b. is one of the iron ores which is known as magnetite
3. The magnetic poles	c. is a man-made magnet.
4. The natural magnet	d. the areas of the magnet which have the most powerful force of attraction.
5. The compass	e. is a space near a magnet where the effect of the magnetic force appears.

1. ..... 2. ..... 3. ..... 4. ..... 5. .....

B. Look at the opposite figure, then answer the following questions:

1. Region (A) represents .....
2. Region (B) represents .....
3. Region (C) represents .....
4. Which region has no effect on magnetic materials?

Lesson 4 Magnetism and electricity

(Guide Answers P. 18)

Worksheet (7)

(Total marks: 20)

1 A. Complete the following sentences:

1. The magnet which is made by the effect of electricity is called .....
2. The magnetic power of the electromagnet ..... by increasing the number of turns in the coil.
3. The electromagnet changes ..... energy into ..... energy.
4. The electromagnet is used in many devices such as ..... and ..... .
5. ..... is used to pick up huge metal blocks.

B. How can you increase the magnetic force of a magnet?

2 A. Choose the correct answer:

1. When an electric current passes through a coil of wire twisted around a wrought iron bar, the wrought iron bar becomes a ..... magnet.
   a. temporary b. permanent c. strong d. weak
2. The magnet which is made by the electricity is a/an ..... .
   a. natural magnet b. electromagnet c. magnetite d. no correct answer
3. The electromagnet loses its magnetism ..... .
   a. by increasing the intensity of electric current
   b. by increasing the number of coil turns
   c. by increasing the number of batteries
   d. by cutting the electric current
4. The magnetic force of the electromagnet increases ..... .
   a. by decreasing the intensity of the electric current
   b. by increasing the number of coil turns
   c. by decreasing the number of batteries
   d. by cutting the electric current

Worksheets & Exams

B. Correct the underlined words:

1. The electromagnet consists of an iron bar and a coil only.
2. We must decrease the number of coil turns in the electromagnet to increase the magnetic force.
3. A huge dynamo is used in a bicycle to light its bulb.

3 A. Write the scientific term for each of the following:

1. The device that is used to change electric energy to magnetic energy. (.....)
2. The device that is used to change kinetic energy to electric energy. (.....)
3. The device that is used in electric power stations to generate electricity. (.....)
4. The device that is used to carry heavy metal blocks. (.....)

B. What happens when...?

1. You increase the number of turns in the coil of the electromagnet.

2. You increase the number of batteries in the electromagnet.

4 A. Give a reason for each of the following:

1. It is preferable to increase the number of batteries in the electromagnet.

2. When an electric current flows through a wire winding around a wrought iron nail, the nail attracts iron filings.

3. An electromagnet is called a temporary magnet.

B. Study the following figures, then answer:

1. What is the name of each device?
2. What is the idea of their working?
3. Mention one use for each one.

Worksheet (8)

(Total marks. 20)

1 A. Complete the following sentences:

1. The dynamo changes ..... energy to ..... energy.
2. The electric current produced by a dynamo increases by ..... and ..... .
3. In the bicycle, ... is used to light the bulb.
4. The electric current has a ..... effect.
5. ..... changes electric energy to magnetic energy.

B. Mention one use for each of the following:

1. The electromagnet.
2. The huge dynamo.
3. Cranes (winches).

2 A. Choose the correct answer:

1. The apparatus that converts the kinetic energy into electric energy is called a/an .....
   a. battery b. dynamo c. electric generator d. (b) and (c)
2. The electric generator (dynamo) works on changing the .....
   a. kinetic energy into electric energy
   b. electric energy into mechanical energy
   c. magnetic energy into mechanical energy
   d. electric energy into magnetic energy
3. The electric current produced by the electric generator (dynamo) increases ..... .
   a. by using a strong magnet b. by increasing the number of coil turns
   c. by using a weak magnet d. (a) and (b)
4. The coil of a dynamo is made up of a ..... wire.
   a. carbon b. copper c. plastic d. graphite
5. The dynamo that is fixed in the bicycle touches the bicycle's ..... .
   a. seat b. pedal c. tire d. gear
6. All the following are among the uses of the electromagnet except ..... .
   a. in factories to move heavy iron blocks b. making electric bells
   c. making TV sets d. moking electric lamps
7. The huge dynamo is used in ..... .
   a. lighting cities b. operating factories
   c. lighting the bicycle's bulb d. (a) and (b)

B. Explain briefly the idea of making a dynamo.

Worksheets & Exams

3 A. Put (✓) in front of the right statement and (✗) in front of the wrong one and correct it:

1. The amount of electricity produced from the dynamo can be increased by using a weak magnet. ( )
2. We can make magnets by using electricity. ( )
3. Magnetism is always related to electricity. ( )
4. The magnetic force of an electromagnet decreases by increasing the number of turns in the coil. ( )
5. The electromagnet loses its magnetism when the electric current is disconnected. ( )
6. The huge electromagnet is used in cranes. ( )

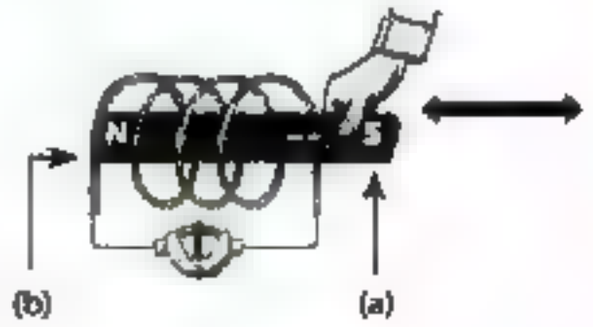
B. Give a reason for each of the following:

1. A dynamo changes the mechanical energy into electric energy.
2. The deviation or movement of the ammeter's pointer when moving the copper wire between the two poles of a magnet.
3. The electromagnet is used to lift heavy iron blocks.
4. In the dynamo, we must increase the motion of the coil between the two poles of the magnet.

4 A. Compare between the electromagnet and the dynamo according to their scientific idea and structure.

B. Look at the opposite figure, then complete the following:

1. Part (a) is ....., but part (b) is ..... .
2. When part (a) is moved inside part (b), ... is generated in part (b).
3. This means that ..... energy can be changed into ..... energy.
4. This is the idea of making ..... .



TIMSS Like questions on Unit 1

Guide Answers P. 18

1 **In this exercise, you will apply what you know about magnets. Write the correct words in the spaces. Choose your words from this list:**

(closed - magnetism - steel - magnetic - bar - keepers - ring)

a. A magnet can attract certain materials to it. An example is ..... . Materials that are attracted by a magnet are called ..... materials.

b. A fridge door has strip magnets down the side of the door. These magnets help to keep the door ..... firmly.

c. Three types of magnets are horseshoe, ... and ..... magnets.

d. All magnets lose their ..... if you drop them or bang them together.

e. You must store magnets with ..... on their ends to keep them strong.

2 **Fill in the spaces in these sentences.**

a. A magnet has a north pole and a ..... pole.

b. Like poles ..... each other.

c. Unlike poles ..... each other.

3 **Here are some terms that you have learnt while studying magnetism.**

Magnetic field	Electromagnet	Magnetic pole	Magnetic field line
Ammeter	Core	Compass	Like poles

The table below shows definitions of four of these terms. Write the terms in the spaces in the first column.

Term	Definition
a.	A temporary magnet which changes electric energy to magnetic energy.
b.	Two north magnetic poles, or two south magnetic poles.
c.	An instrument used to measure electric current.
d.	A line drawn to show the direction of a magnetic field.

Worksheets & Exams

4 **Each statement below has an incorrect part:**

- Cross out the incorrect part of each statement.
- In the space below, write a correction so that the statement is correct.

1. A bar magnet has a north pole at one end and a west pole at the other.

2. The north pole of a magnet is attracted to the earth's south pole.

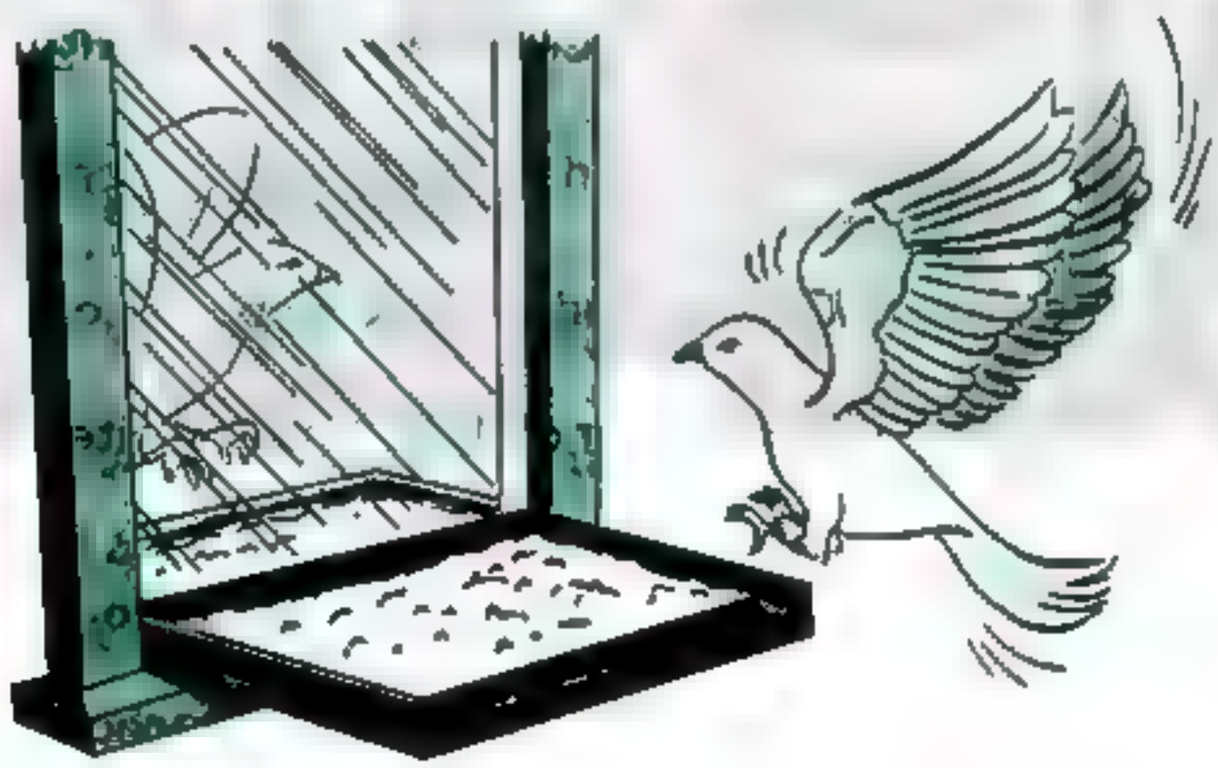
3. A bar magnet needs an electricity supply to work.

4. The core of an electromagnet must be made of a non-magnetic material.

5. An electromagnet remains magnetized when the electric current in its coils is switched off.

6. Decreasing the current in an electromagnet will make its magnetic field stronger.

5 **The picture below shows a bird landing at a bird feeder outside a window.**



- The image of this bird in the window is the result of light being

1. absorbed. (.....)
2. reflected. (.....)
3. transmitted. (.....)
4. refracted. (.....)

Al-Adwaa General Tests on Unit 1

Guide Answers P. 18

Test 1

1 A. Write the scientific term for each of the following:

1. The phenomenon that occurs when sunlight passes through water droplets during rainfall. (.....)
2. The colored light that is produced by mixing red and blue lights. (.....)
3. The device that converts electric energy into magnetic energy. (.....)
4. The light that results from mixing the seven spectrum colors. (.....)
5. The seven colors of light which sunlight is made up of. (.....)

B. Give a reason for each of the following:

1. Nickel, iron and cobalt are magnetic materials.

2. We see the white board as it is.

3. We cannot see any object behind a sheet of carton paper.

4. A dynamo changes the mechanical energy into electric energy.

2 A. Complete the following sentences:

1. The white light can split into ..... colors that are called ..... .
2. Red light + green light + blue light = ...
3. The magnet has ..... poles which are ..... and ..... .
4. When the white light strikes a black opaque object, this object ..... all the spectrum colors and does not ..... any color.
5. Light reflects when it falls on ..... and ..... surfaces.

B. What happens if...?

1. You look at a picture through tissue paper.

2. You mix green and blue lights.

Worksheets & Exams

3. A magnet is hung to move freely.

4. Sunlight strikes a transparent blue bottle.

3 A. Choose the correct answer:

1. The bar used in an electromagnet is made up of _____ .
   a. alumimum b. wrought iron c. steel d. copper
2. The characteristics of the object's image that is formed through narrow holes are ..... .
   a. minimized and inverted b. enlarged and inverted
   c. minimized and upright d. enlarged and upright
3. As light falls on the banana fruit, the banana absorbs all colors except the ..... one.
   a. red b. yellow c. black d. green
4. The magnetic force of the magnet disappears at ..... .
   a. its two poles b. the south pole of the magnet
   c. the north pole of the magnet d. its middle
5. Once the seven spectrum colors accumulate with each other, you can see the ..... light.
   a. red b. blue c. orange d. white

B. Mention one use for each of the following:

1. The electromagnet.
2. The huge dynamo.
3. Cranes.

4 A. Mention the properties of the magnet.

B. What is meant by...?

1. The magnet.
2. The magnetic field.
3. The electromagnet

C. Label the diagram:

a.

b.

c.

Test 2

1 A. Complete the following sentences:

1. A dynamo changes the ..... into electric energy.
2. Ancient Greeks discovered black rocks in a region called ..... and these rocks attract materials which are made of ..... .
3. Moonlight is the reflection of the ..... that falls on its surface.
4. Mixing ..... and ..... lights gives the magenta light color.

B. Choose the correct answer:

1. ..... does not allow light to pass through.
   a. Tissue paper b. Fruit c. Clear glass d. Air
2. All the following are primary colors except ..... .
   a. red b. green c. blue d. yellow
3. The strawberry fruit seems red as it ..... the red color only.
   a. refracts b. absorbs c. transmits d. reflects
4. When the magnet is hung freely, it points to the ..... direction.
   a. north-west b. north-east c. north-south d. east-south

2 A. Put (✓) in front of the right statement and (✗) in front of the wrong one:

1. Light bouncing after falling on an object is called light refraction. ( )
2. We can see the spectrum colors when sunlight passes through water droplets during rainfall. ( )
3. Yellow, purple and blue are secondary light colors. ( )
4. The space around a magnet where the magnetic force appears is called the magnetic field. ( )

B. What happens in each of the following?

1. Moving a copper wire between two poles of a magnet.

2. You look at the mirror.

3. You suspended a bar magnet to move freely.

4. Seeing the spoon inside a glass containing water.

Worksheets & Exams

3 **A. Look at the opposite figure, then answer:**

1. The opposite figure indicates the .... phenomenon.
2. The speed of light through air is ..... its speed through water.
3. Why does the pencil appear broken?

B. Choose from column (B) what suits in column (A):

(A)	(B)
1. Light	a. is an opaque material.
2. Shadow	b. separates light into seven colors.
3. Glass	c. is a transparent material.
4. Carton paper	d. propagates in straight lines.
5. Prism	e. reflects sunlight.
	f. is a dark area formed behind a body exposed to light.

1. ..... 2. ..... 3. ..... 4. ..... 5. .....

4 **A. Compare between regular reflection and irregular reflection.**

Regular reflection	Irregular reflection
.....	.....

B. Give a reason for each of the following:

1. Clear water and transparent plastic are transparent materials.

2. The formation of the light spectrum.

3. In the electromagnet, we have to increase the number of batteries.

4. Some materials are known as non-magentic materials.

Test 3

1 A. Complete the following sentences:

1. The glass prism separates the white light into ..... spectrum colors.
2. In the dynamo, ... energy changes to ..... energy.
3. The magnetic force of the magnet is concentrated at ..... .
4. The spectrum colors start with ..... and end with ..... .
5. If you stand at 25 cm from a plane mirror, your image is formed at ..... cm from you.

B. Write the scientific term for each of the following:

1. The colors: yellow, cyan and magenta. ( )
2. The reflection of light when it falls on a rough surface (containing protrusions). ( )
3. The tool which is used to separate white light into seven spectrum colors. ( )
4. The set which is used for locating the four main geographical directions. ( )
5. The object which absorbs all the spectrum colors falling on it. ( )

2 A. Give a reason for each of the following:

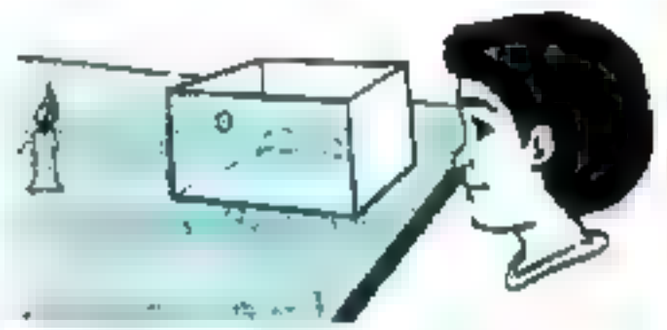
1. A magnet attracts metallic paper clips but does not attract copper wires.
2. Yellow is known as a secondary light color.
3. The moon seems luminous.
4. You can see your face in a plane mirror.
5. A compass is used for locating the four main geographical directions.

Worksheets & Exams

B. Put (✓) in front of the right statement and (✗) in front of the wrong one:

1. Mixing the red color with the green color gives the yellow color. ( )
2. When an object approaches a light source, the area of the shadow decreases. ( )
3. An object seems white since it reflects all the colors which white light is made up of. ( )
4. In the irregular reflection, light rays are reflected in one direction. ( )
5. The magnetized needle is the basic idea of making the compass. ( )

3 A. Look at the opposite figure, then answer:



1. What is your observation?

2. What is your inference?

B. Mention one use for the following:

1. The compass.

2. The electromagnet.

4 A. What happens if...?

1. You approach paper clips to a magnet.

2. You approach the north pole of a magnet to the north pole of another magnet.

B. Mention one use for:

1. A glass prism.

2. The electromagnet.

3. The dynamo.

Unit 2 Mixtures

Lesson 1 Mixtures

(Guide Answers P. 21)

Worksheet (9)

(Total marks: 20)

1 A. Complete the following sentences:

1. The substance that is made of only one type of identical particles is known as ..... , while the substance which consists of more than one is known as ..... .
2. The mixture of soda water is produced from dissolving ..... gas in a ..... solution.
3. The mixture of sand and iron filings can be separated by .....
4. Sugar and water can be mixed by ..... or .....

B. Define each of the following:

1. A pure substance.
2. A mixture.
3. A solid-solid mixture.
4. A liquid-liquid mixture.

2 A. Choose the correct answer:

1. All the following are examples of mixtures except .....
   a. baking soda b. concrete c. milk d. tomato sauce
2. Among the examples of gaseous-liquid mixtures is the ..... .
   a. mixture of vinegar and water b. mixture of sand and water
   c. mixture of soda water d. atmospheric air
3. A mixture can be formed by ..... .
   a. shaking b. stirring
   c. grinding d. all the previous answers
4. All the following are examples of pure substances except .....
   a. milk b. distilled water c. table salt d. baking soda

Worksheets & Exams

B. Choose from column (B) what suits column (A):

(A)	(B)
1. Distilled water	a. is a solid-liquid mixture.
2. Seawater	b. is a pure substance.
3. Oil and water	c. is a homogeneous liquid mixture.
4. Vegetable salad	d. is a heterogeneous liquid mixture.
	e. is a solid-solid mixture.

1. _____ 2. _____ 3. _____ 4. _____

3 A. Write the scientific term for each of the following:

1. Substances that consist of more than one type of particles. (.....)
2. A type of matter whose components keep their own properties. (.....)
3. A mixture of oxygen gas, hydrogen gas, carbon dioxide gas and water vapor. (.....)
4. A mixture of water and some useful minerals. (.....)
5. A mixture of carbon dioxide gas in a sugary solution. (.....)

B. Give a reason for each of the following:

1. Air is considered a mixture.

2. Sugar is considered a pure substance.

3. No mixing will happen on adding sand to water.

4 A. What happens in case of...?

1. Mixing salt and water.

2. Mixing different juices together.

B. Cross the odd word out:

1. Sugar – salt – baking soda – concrete (.....)
2. Tomato sauce – apple juice – strawberry juice – banana juice (.....)

Worksheet (10)

(Total marks: 20)

1 A. Complete the following sentences:

1. The components of the mixture can be ..... by any ..... .
2. Sand and salt can be mixed by ..... or ..... .
3. The magnetic attraction is used to separate a ..... mixture that contains ..... substance.
4. The evaporation process is used to separate ..... materials that are ..... in water.
5. The separating funnel is used to separate the heterogeneous ..... mixtures.

B. Correct the underlined words:

1. The atmospheric air is an example of liquid-liquid mixtures. (.....)
2. A sugary solution can be formed by shaking or grinding. (.....)
3. A mixture of vinegar and water is an example of solid-liquid mixtures. (.....)
4. A salty solution can be formed by grinding. (.....)
5. The separating funnel is used to separate a mixture of sugar and water. (.....)

2 A. Put (✓) in front of the right statement and (X) in front of the wrong one and correct it:

1. The separating funnel is used to separate heterogeneous liquid mixtures. ( )
2. Filtration is used to separate oil-water mixtures. ( )
3. Salt and water are mixed together by stirring or heating. ( )
4. Filtration is used to separate a mixture that has a soluble solid material. ( )
5. We can use the evaporation process to separate crushed coffee from water. ( )

B. Give a reason for each of the following:

1. A fruit salad mixture is considered an example of solid-solid mixtures.

2 . A mixture of vinegar and water is considered an example of liquid-liquid mixtures.

3. A sand and water mixture is considered an example of solid-liquid mixtures.

Worksheets & Exams

3 A. Write the scientific term for each of the following:

1. The mixture that is produced by dissolving carbon dioxide gas in a sugary solution. (.....)
2. A mixture resulting from the solubility of solids in liquids. (.....)
3. The process that is used in the formation of a solution. (.....)
4. Leaving an amount of seawater exposed to the sun rays for many days. (.....)
5. Heating a salty solution gently. (.....)

B. Choose from column (B) what suits in column (A):

(A)	(B)
1. The separating funnel	a. is a solid-solid mixture.
2. The atmospheric air	b. is a gaseous-liquid mixture.
3. Fruit salad	c. is used to separate sand and water mixtures.
4. The mixture of carbon dioxide gas in a sugary solution	d. is used to separate oil-water mixtures.
5. Filtration process	e. is a gaseous-gaseous mixture.

1. ..... 2. ..... 3. ..... 4. ..... 5. .....

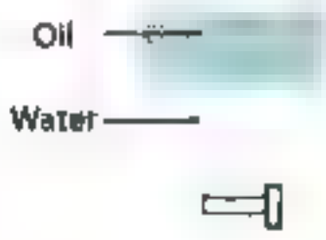
4 A. Mention one use for each of the following:

1. A filter paper.
2. A separating funnel.
3. A magnet.

B. Look at the following figure and then answer the questions:

1. Which apparatus is shown in this figure?

2. Why do we use this tool in separating some types of mixtures?



3. What is the mixture that can be separated by this tool?

Lesson 2 Solutions

(Guide Answers P 22)

Worksheet (11)

(Total marks: 20)

1 A. Complete the following sentences:

1. A solution is a type of ..... .
2. A solution consists of a ..... and a ..... .
3. A solution consists of a solute which is ..... and a solvent which is ..... .
4. The stirring process is necessary for ..... the solute in the ..... .
5. ..... is a heterogeneous liquid mixture in which the particles of the solute are ..... throughout the solvent.
6. Among the examples of suspension are ..... and ..... .
7. Shaking has the same effect of the ..... process.

B. What is meant by ...?

1. A homogeneous mixture.
2. A solvent.
3. A solubility process.

2 A. Put (✓) in front of the right statement and (X) in front of the wrong one and correct it:

1. A mixture of sugar and water is a heterogeneous mixture. ( )
2. A solvent is a liquid used to dissolve the solid material in it. ( )
3. Solute + solvent $\xrightarrow{\text{solubility process}}$ solution ( )
4. Solubility time increases as the amount of the solvent decreases. ( )
5. Solubility speed decreases by shaking and rising the temperature. ( )
6. Solubility speed of solids increases by grinding. ( )

Worksheets & Exams

B. What happens when...?

1. Putting a spoonful of salt in an amount of water and then stirring them by using a glass rod.

2. Stirring two equal amounts of sugar in two beakers containing unequal amounts of water.

3 A. Give a reason for each of the following:

1. A salty solution is a homogeneous mixture.

2. The natural orange juice is a heterogeneous mixture.

3. The apple juice is a solution.

B. Correct the underlined words:

1. Increasing the quantity of a solvent increases dissolving time.

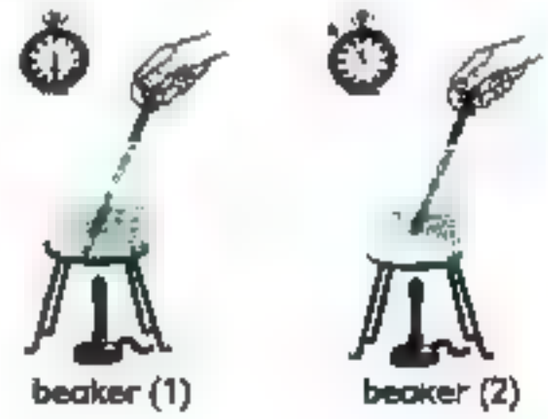
2. Filtration is used to separate substances dissolved in the solution.

3. Stirring decreases solubility process.

4 A. Look at the opposite figures, then answer the following.

1. Which beaker contains sodium carbonate solution and which one contains sodium chloride solution?
(knowing that the sodium chloride dissolves faster than sodium carbonate).
.....

2. Conclusion: .....



B. Make an activity to prove that temperature affects the solubility process.

Worksheet (12)

(Total marks: 20)

1 A. Complete the following sentences:

1. ..... is considered a general solvent because of its ability to dissolve most materials.
2. Mixing a small amount of mud with water forms ..... that can be separated by ..... .
3. Increasing the quantity of a solvent ..... solubility time.
4. Increasing ..... reduces the solubility time.
5. Increasing the temperature ..... solubility time.

B. What happens when...?

1. You have two beakers containing equal amounts of water and equal amounts of sugar, heat one of the two beakers and leave the other without heating.

2. Increasing the quantity of a solute.

3. Increasing the quantity of a solvent.

2 A. Write the scientific term for each of the following:

1. The mixture whose components can be distinguished. (.....)
2. The material in which the solute disappears. (.....)
3. The homogeneous liquid mixture. (.....)
4. The substance which dissolves in the solvent. (.....)

B. Which of the following processes takes place faster than the others and why?

1. Dissolving a quantity of salt in hot water or dissolving the same quantity of salt in cold water.

2. Dissolving a quantity of sugar in water with stirring or dissolving the same quantity of sugar in the same quantity of water without stirring.

Worksheets & Exams

3. Dissolving an amount of salt in 100 ml of water or dissolving the same quantity of salt in 300 ml of water.

3 A. Choose from column (B) what suits in column (A):

(A)	(B)
1. A solvent	a. are mixtures in liquid states.
2. A solute	b. is a process of separation of the solute from the solvent.
3. Solutions	c. is a substance which exists in a big quantity in the solution.
4. Filteration	d. is a substance which exists in a small quantity in the solution.

1. ..... 2. 3. 4. .....

B. Give a reason for each of the following:

1. A solution is a type of mixtures.

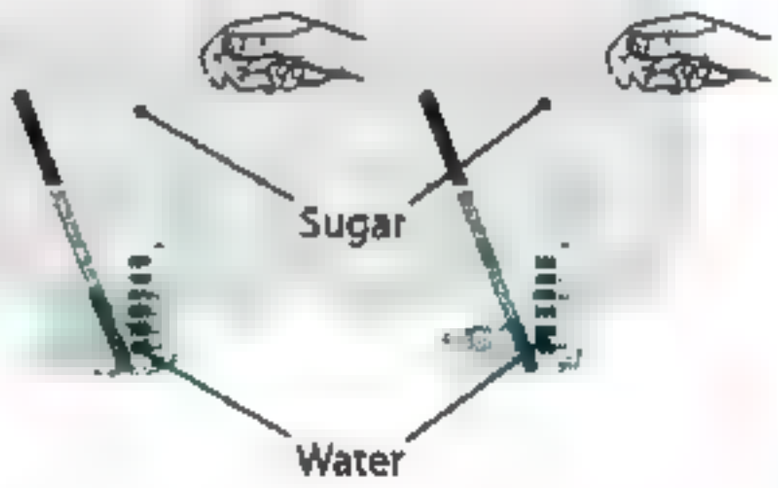
2. There are different types of mixtures.

3. Water is considered a common solvent.

4 A. Put equal quantities of sugar in different quantities of water in two beakers.

1. Sugar dissolves faster in the beaker with .

2. Solubility process ..... by increasing the quantity of the solvent.



B. Mention the difference between:

1. A mixture and a solution.

2. The natural orange juice and apple juice.

3. A solute and solvent.

4. Grinding and shaking.

TIMSS Like questions on Unit 2

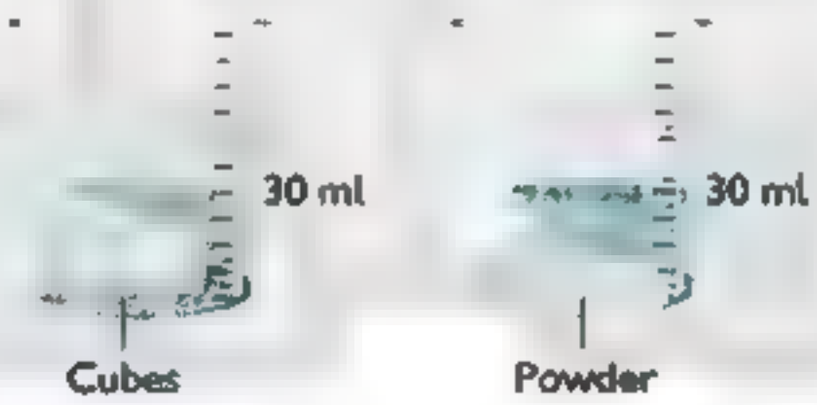
Guide Answers P. 23

1 **The diagram represents a beaker containing sugar, water and sand. The sugar is dissolved in the water, creating a solution. The sand has settled to the bottom of the beaker.**

a. Describe one method to separate the sand from the other substances in the beaker.

b. Describe one method to separate the dissolved sugar from the sugar-water solution.

2 **You have two containers and both of them have the same amount of water.** You add the same amount of sugar to each one. One of the two amounts is powder and the other is cubes. Which one dissolves first? Explain your answer.



3 **What is the correct answer to Eslam's question?**

Tick (✓) the correct answer:

1. The water used for dissolving a solid. ☐
2. A solid which dissolves in water. ☐
3. A solid dissolved in water. ☐
4. A solid which does not dissolve in water. ☐

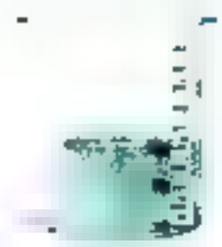
Eslam

Worksheets & Exams

4 **Ali makes a sugary solution by adding sugar to water.**

a. Complete the sentences using either the word solute or solvent in each of the spaces.

Ali leaves the solution he made for a long time in a warm room, and ..... evaporates. When all ..... has gone, only the ..... is left.



b. What is the name of the process used to get the solid back from the solution?

c. What happens to the concentration of the sugary solution as the water is removed?

5 **Five solids: baking soda, flour, instant coffee, sand and sugar were added to hot water and stirred. The diagrams show what each looked like after the solids had been added to the hot water?**

a. Which of the solids are in the beakers?

A ..... B .....

C ..... D .....

E .....

b. Some of the solids dissolve in the hot water. What is the meaning of the word dissolved?

c. Which one of the solids reacted with the water and how can you tell it reacted?

Al-Adwaa General Tests on Unit 2

Guide Answers P. 23

Test 1

1 A. Write the scientific term for each of the following:

1. Disintegration of the solute into particles which spread throughout the solvent. (.....)
2. It contains more than one type of particles, its components do not join together. (.....)
3. The process that is used to separate a sugary solution. (.....)
4. The process that is used for mixing solid substances with liquids. (.....)

B. Choose from column (B) what suits in column (A):

(A)	(B)
1. A quantity of solvent	a. is a liquid whose components mix together where their particles disintegrate and cannot be seen.
2. A pure substance	b. is used to separate the insoluble solid material from the solution.
3. A solution	c. is among the factors which the rate of dissolution depends on.
4. Filtration	d. is made only of one type of particles.

1. ..... 2. ..... 3. ..... 4. .....

2 A. Complete the following sentences:

1. Stirring the solution ..... the dissolving time.
2. ..... is used for mixing solid materials together with liquids.
3. ..... is used to separate solid materials containing iron filings.
4. ....., is formed of a solute and a solvent.

B. Choose the correct answer:

1. On the formation of a salty solution (table salt) and leaving it for a period of time, ...

a. nothing happens
b. table salt precipitates
c. water evaporates
d. salt remains

Worksheets & Exams

2. It is possible to obtain fresh water from seawater by ..... .
   a. condensation and then evaporation b. melting and then freezing
   c. evaporation and then condensation d. freezing and then melting
3. When the amount of solvent increases, the solubility time ..... .
   a. increases b. decreases c. no effect d. (a) and (b)

3 A. Give a reason for each of the following:

1. Solution is a type of mixtures.

2. Chalk in water is a heterogeneous mixture.

3. Dissolving sugar in hot water is faster than in cold water.

B. What is meant by ...?

1. A pure substance.
2. A mixture.
3. A solid-solid mixture.
4. A liquid-liquid mixture.

4 A. What happens when...?

1. Grinding pepper with salt.

2. Carbon dioxide gas passes through a sugary solution.

3. The amount of solute increases.

4. Stirring a mixture of sugar and water.

B. Compare between the pure substance, mixture and solution.

Pure substance	Mixture	Solution
.....	.....	.....
.....	.....	.....
.....	.....	.....

Test 2

1 **A. Complete the diagram:**

Ways to separate mixtures

Such as: sand and water | Such as: salt and water | Such as: oil and water | Such as: salt and metal clips

B. Put (✓) in front of the right statement and (✗) in front of the wrong one:

1. Solubility process depends on the solute only. ( )
2. Among the factors affecting solubility process is the quantity of the solute. ( )
3. Green salad is a mixture of solid substances. ( )
4. Increasing the temperature increases dissolving time. ( )
5. Alloys are formed by mixing different metals by fusion and then cooling. ( )

2 **A. Mention an example for each type of the following:**

1. Solid-solid mixture.
2. Liquid-liquid mixture.
3. Gaseous-gaseous mixture.

B. Write the scientific term for each of the following:

1. The common solvent that has the ability to dissolve several substances. (.....)
2. Leaving an amount of sea water exposed to the sun rays for many days. (.....)
3. The mixture that is formed of a solvent and a solute. (.....)
4. The process that is used to separate the insoluble solid materials in the solution. (.....)

3 **A. Give a reason for each of the following:**

1. Both distilled water and salt are pure substances.

Worksheets & Exams

2. Milk and tomato sauce are mixtures.

3. Air is considered a gaseous-gaseous mixture.

4. Heterogeneous mixture is formed by adding sand to water.

B. Compare between the solute and the solvent:

Solute	Solvent

4 A. What happens when ...?

1. Salty water is left for a long time.

2. The amount of a solvent increases.

3. The temperature of a solvent increases.

4. Mixing different juices together.

B. What is meant by ...?

1. A solvent.

2. A solute.

3. A solution.

4. Solubility process.

Test 3

1 A. How to separate the following mixtures:

1. A solution of mud and water.

.....

2. A solution of oil and water.

.....

3. A sugary solution.

.....

B. Write the scientific term for each of the following:

1. The process by which a solute dissolves in a solvent. (.....)
2. The homogeneous liquid mixture. (.....)
3. The substance that is made of one type of particles. (.....)
4. The way that is used to form a salty solution. (.....)

2 A. Choose the correct answer:

1. ..... is a way used to separate a mixture which has precipitates.

   a. Filtration b. Evaporation c. Separating funnel

2. The substance which dissolves on the formation of solution is called ..... .

   a. solute b. solvent c. solubility

3. Among the the factors affecting the solubility process is ..... .

   a. evaporation b. filtration c. temperature

B. What happens when ...?

1. Adding salt to water and stirring.

.....

2. Putting a magnet near a mixture of iron filings and salt.

.....

3. Mixing different metals with each other by fusion and then cooling.

.....

4. Putting two equal amounts of sugar and salt in two beakers containing the same amount of water.

.....

Worksheets & Exams

3 A. What is meant by ...?

1. A mixture.

2. A homogeneous mixture.

3. A heterogeneous mixture.

B. Put (✓) in front of the right statement and (✗) in front of the wrong one:

1. We use the filtration process to separate mixtures which have deposits. ( )
2. We can use evaporation process to separate crushed coffee from water. ( )
3. The solubility speed of solids increases by grinding. ( )
4. Solute + solvent $\xrightarrow{\text{solubility process}}$ solution. ( )

4 A. Compare between a homogeneous mixture and a heterogeneous mixture:

Homogeneous mixture	Heterogeneous mixture

B. Give a reason for each of the following:

1. Adding sand to water is considered a heterogeneous mixture.

2. Air is a mixture.

3. Water Is considered a common solvent.

4. It is better to dissolve sugar in water by heating and stirring.

Unit 3 Environmental Balance

Lesson 1 Food relationships among living organisms

(Guide Answers P. 24)

Worksheet (13)

(Total marks: 20)

1 A. Complete the following sentences:

1. From the food relationships are ..... and predation.
2. ..... is the main source of energy for living organisms.
3. The relationship between a lion and a deer is ....., while the relationship between leguminous plants and nodular bacteria is ..... .
4. Green plants are ..... as they make their own food by ..... .
5. Among the insectivorous plants are ....., ... and ..... .

B. What is meant by ...?

1. Autotrophic organisms. .....
2. Predation. .....
3. A predator. .....
4. A prey. .....

2 A. Write the scientific term for each of the following:

1. A temporary food relationship between two living organisms that ends by devouring the prey. (.....)
2. The animal that ejects a black fluid in water to hide from enemies. (.....)
3. The animal that changes its color to be like the surrounding environment. (.....)
4. Organisms that get food from dead bodies. (.....)
5. The relationship between nodular bacteria and legumes. (.....)

B. Correct the underlined words:

1. Green plants are heterotrophic organisms. (.....)
2. The frog ejects a fluid in the surrounding water to hide from enemies. (.....)

Worksheets & Exams

3. The strong organism in a predation relationship is called a prey. (.....)
4. Camouflage, mimicry and hiding are some ways of self-defence against parasitism. (.....)

3 A. Give a reason for each of the following:

1. Plants are the main source of food for lions although lions are carnivorous.
2. Some plants feed on insects.
3. Predation is less common in plants.
4. The bean plant does not need nitrogenous fertilizers.
5. Drosera is from the insectivorous plants.

B. Compare between camouflage and mimicry.

Points of comparison	Camouflage	Mimicry
Definition		
Example		

4 A. What happens if ...?

1. The honeybee does not look like wasps.
2. Green plants cannot make photosynthesis.

B. Explain in detail an example of mutualism.

Worksheet (14)

(Total marks: 20)

1 A. Complete the following sentences:

1. Spiders make webs to catch .....
2. The color of a butterfly being like that of a tree is considered a .....
3. The types of food relationships are ....., symbiosis, and .....
4. A lion feeds on green plants .....

B. Give a reason for each of the following:

1. A chameleon can hide from its enemies.

.....

2. A host's death is considered a loss to a parasite.

.....

3. Mosquitoes and lice are external parasites.

.....

4. Bread mold, mushroom and penicillium fungi are saprophytes.

.....

2 A. Choose the correct answer:

1. The food relationship which ends quickly is called .....
   a. parasitism b. saprophytism c. commensalism d. predation
2. Useful living organisms living on the roots of bean plant are .....
   a. fungus b. algae c. nodular bacteria d. viruses
3. The process of photosynthesis is done by a ..... living organism.
   a. producer b. consumer c. decomposer d. saprophyte
4. The fungus which decomposes orange fruit is called .....
   a. mushroom b. taenia c. penicillium d. ascaris

B. What happens when ...?

1. Leaving moist bread in a closed sac.

.....

2. Absence of saprophytes.

.....

3. An enemy attacks sepia.

.....

4. A chameleon does not simulate its surrounding environment.

.....

Worksheets & Exams

3 A. Correct the underlined words:

1. Halophila feeds on insects to get the required elements for making carbohydrates. (.....)
2. The relation between the sponge and tiny aquatic living organisms is predation. (.....)
3. Some bees look like wasps as a form of camouflage. (.....)
4. Mosquitoes make webs to catch insects. (.....)

B. Choose from column (B) what suits in column (A):

(A)	(B)
1. An example of predation	a. Nodular bacteria and leguminous plants.
2. An example of external parasite	b. Bilharzia worm and man.
3. An example of internal parasite	c. Bacteria and bodies of dead organisms.
4. An example of saprophytism	d. Man and lice.
5. An example of mutualism	e. Cats and mice.

1. ..... 2. ..... 3. ..... 4. ..... 5. .....

4 A. Put (✓) in front of the correct statement and (✗) in front of the incorrect statement and correct it:

1. Filarial worm, tapeworm and ascaris worm are external parasites. ( )
2. The relationship between filarial worm and man is parasitism. ( )
3. Mutualism and commensalism are the two types of symbiosis only. ( )
4. Predation is a temporary relationship between a predator and a prey. ( )

B. 1. What is the benefit of ...?

a. Tiny aquatic organisms from sponge.

.....

b. Bacteria in man's intestine.

.....

2. Show the food relationships in the following figures:

1. ..... 2. ..... 3. ..... 4. .....

Lesson 2 Environmental balance

(Guide Answers P. 25)

Worksheet (15)

(Total marks: 20)

1 A. Complete the following sentences:

1. ..... is a natural area that contains living organisms and non-living things.
2. The ocean is a ..... ecosystem.
3. The non-living components of an ecosystem are air, ... and soil.
4. Plants depend on ..... to absorb water and salts.
5. The ..... disappeared in ancient eras due to change in natural conditions.

B. Explain the relation between each of the following:

1. Plants & animals.
2. Fungus & animals.

2 A. Choose the correct answer:

1. A water pond is considered a ..... ecosystem.
   a. small b. large c. very large d. huge
2. An ecosystem consists of ..... .
   a. living organisms b. non-living things
   c. both of them (a,b) d. none of them
3. The disappearance of dinosaurs was due to ..... .
   a. the change in natural conditions b. man interference
   c. (a, b) d. none of them
4. Predation ..... the numbers of prey populations.
   a. organizes b. recycles c. gets rid of d. removes
5. Eroding the soil leads to the ..... .
   a. environmental balance b. environmental imbalance
   c. soil fertility d. increased crops

B. What is the effect of saprophytism relationship on the environmental balance?

Worksheets & Exams

3 A. Write the scientific term for each of the following:

1. The natural area which includes living organisms and non-living organisms. ( )
2. The relationship that helps the prey populations to get rid of weak or sick members. ( )
3. The balance among the components of the ecosystem. ( )
4. A very large ecosystem. ( )

B. Give a reason for each of the following:

1. Plants absorb water and salts from soil.
2. Saprophytes complete food chains and webs.
3. Saprophytes have an important role in industry.
4. There is a continuous interaction among environmental components.

4 A. What happens in case of ...?

1. Killing the American hawks.
2. Introducing rabbits to an island with no natural enemies.
3. Cutting down trees by man.
4. Chemical elements are not recycled by saprophytic organisms in an ecosystem.

B. Correct the underlined words:

1. The environmental balance is any natural area including living organisms and non-living things. ( )
2. The interaction among the environment components is a stopped process. ( )
3. The disappearance of huge birds in ancient eras was due to natural changes. ( )
4. Absence of predators increases the numbers of saprophytes. ( )

Worksheet (16)

(Total marks: 20)

1 A. Choose the correct answer:

1. All the following are components of a desert ecosystem except the .....
   a. deer b. cactus c. shark d. snake
2. Without the saprophytic organisms, the earth's surface would be covered by bodies of .....
   a. plants b. animals
   c. living organisms d. dead organisms
3. The predation relationship ..... the numbers of prey populations.
   a. increases b. organizes c. decreases d. presents
4. Saprophytic organisms ..... the chemical elements within the ecosystem.
   a. provide b. save c. keep d. recycle

B. What is the effect of each of the following on the environmental balance?

1. Saprophytism.

2. Predation.

2 A. Put (✓) in front of the right statement and (✗) in front of the wrong one and correct it:

1. Interaction among the components of the environment leads to imbalance in the ecosystem. ( )
2. Lions are examples of extinct animals due to a change in the natural conditions of the environment. ( )
3. The balance of the ecosystem occurs due to man's interference. ( )
4. Change in natural conditions leads to the environmental balance. ( )
5. The predation relationship keeps the balance within the ecosystem. ( )

Worksheets & Exams

B. Give a reason for each of the following:

1. The extinction of dinosours in ancient ages.

2. Plants are called autotrophic organisms.

3. A competition may appear among prey populations in an ecosystem.

3 A. Correct the underlined words:

1. Saprophytism gets rid of weak or sick preys. (.....)
2. The interaction among the environmental components is a stopped process. (.....)
3. Animals feed on plants to get food and oxygen. (.....)
4. A water pond is a large ecosystem. (.....)

B. Write the scientific term for each of the following:

1. The organisms which organize the numbers of prey populations in the ecosystem. (.....)
2. The phenomenon that appears among prey populations due to the food shortage. (.....)
3. The organisms which clean the earth's surface from dead bodies. (.....)

4 A. Define:

1. The ecosystem.

2. The environmental balance.

B. How does man get benefit from saprophytes in industry?

TIMSS Like questions on Unit 3

Guide Answers P. 25

1 **Match each word to its meaning:**

1. Camouflage
2. Mutualism
3. Commensalism
4. Parasitism
5. Saprophytism

a. A food relationship in which the decomposers get their food by decomposing food remains or bodies of dead organisms.

b. A phenomenon in which a living organism can change its color to simulate the colors of the environment to hide from enemies.

c. A food relationship between two living organisms in which one of them benefits, while the other neither gets benefit nor is harmed.

d. A food relationship between two living organisms and both get benefits.

e. A food relationship between two living organisms, one benefits from the other known as a parasite and the other one is harmed known as a host.

2 **The figure shows some parts of an ecosystem:**

a. (i) In what form is energy passed from the sun to the grass?

.....

(ii) In what form is energy passed from the grass to the zebra?

.....

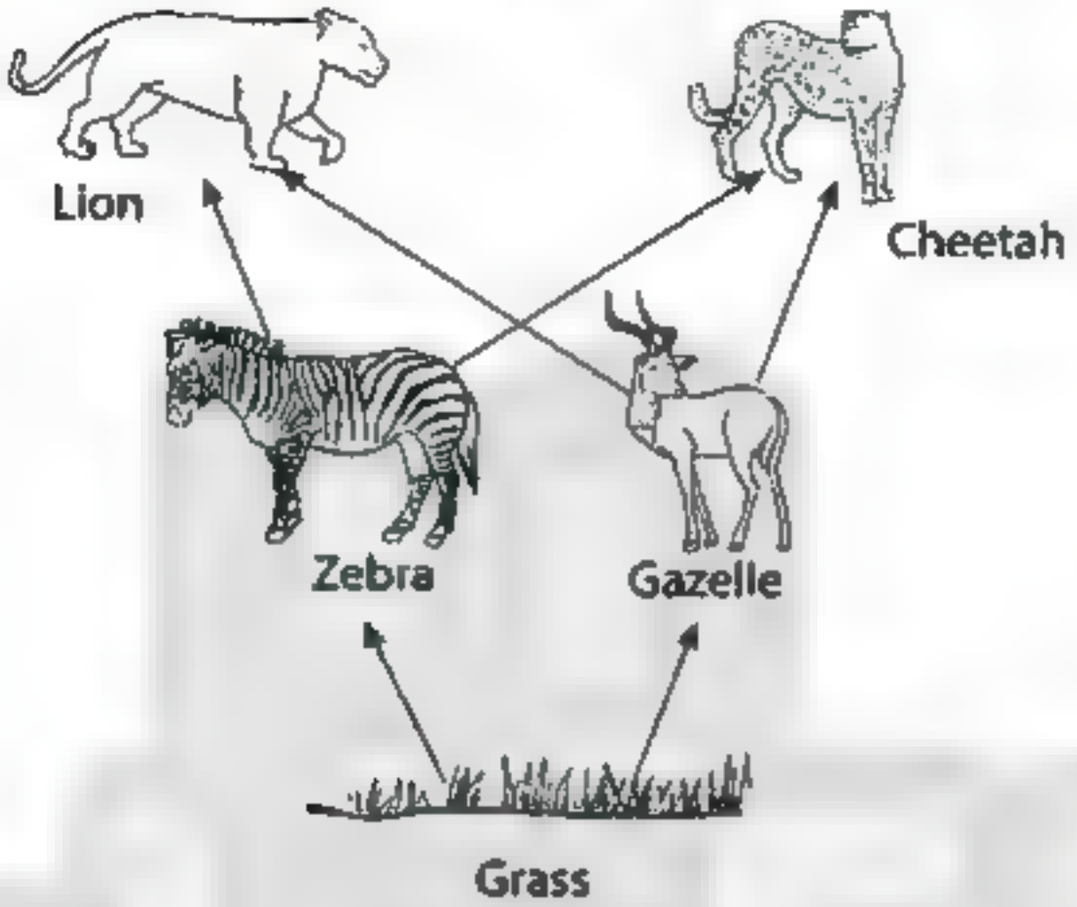
Worksheets & Exams

b. When the zebra dies, the energy in its body is released by decomposers.

- Name one group of microorganisms involved in the process.

.....

3 The diagram shows part of food web:



a. (I) What do the arrows on the food web show?

.....

(Ii) Which of the organisms in this web compete for grass?

.....

(iii) Which of the organisms in this web are predators?

.....

b. Hyenas are scavengers. They eat the parts of dead zebras and gazelles which other animals have not eaten. Use this information to add hyenas into the food web above.

.....

4 Put these words in the right places:

(mimicry - parasite - host - bug - filarial worm)

1. A ..... benefits from the other and the other one is harmed.
2. A ..... is harmed and infected by diseases.
3. ..... is considered internal parasitism.
4. ..... is considered external parasitism.

Al-Adwaa General Tests on Unit 3

Guide Answers P. 25

Test 1

1 **A. Complete the following sentences:**

1. Predation is less common in the _____ world than in the animal world.
2. Some animals feed on other animals to get food and ..... .
3. A butterfly uses .... as it stands on a tree with a similar color.
4. ..... make weaves to catch insects.

B. Put (✓) in front of the right statement and (✗) in front of the wrong one:

1. The devoured animal is the predator. ( )
2. Penicillium recycles carbon, nitrogen and sulphur in orange fruit. ( )
3. Saprophytes are used in cheese industry. ( )
4. Fleas cause malaria disease. ( )
5. Predators organize the numbers of preys. ( )

2 **A. Choose the correct answer:**

1. The jawless lamprey is the _____ .
   a. host b. parasite c. saprophyte d. decomposer
2. Lice are _____ .
   a. internal parasites b. external parasites
   c. decomposers d. predators
3. Nodular bacteria fix nitrogen in a/an ..... form to provide the plant with.
   a. organic b. inorganic c. living d. non-living
4. Death of the host is a great loss for the _____ .
   a. parasite b. saprophyte c. prey d. predator
5. Predation is a ..... process.
   a. permanent b. temporary c. continuous d. long time

B. Mention the food relation between:

1. Lions and zebras. .....
2. Nodular bacteria and leguminous plants. .....
3. Bread mold and bread. .....

Worksheets & Exams

4. Ticks and dogs.
5. Mosquito and man.

3 A. Write the scientific term for each of the following:

1. The food relationship in which one organism benefits from the other whereas the other is harmed. (.....)
2. The disease that is caused by ascaris worm. (.....)
3. Plants which devour tiny insects. (.....)
4. A balance among the components of the ecosystem. (.....)

B. What is meant by ...?

1. Predation.
2. The predator.
3. The host.
4. External parasitism.

4 A. Give a reason for each of the following:

1. Predation is less common in the plant world.
2. The food relationship between lions and deers is predation.
3. A butterfly stands on a tree with a similar color.
4. A chameleon simulates the color of its surrounding environment.

B. Compare between commensalism and mutualism:

Commensalism	Mutualism

نفوقك في أي عمل عليه العلامة دي ذاكرولي

Test 2

1 A. Complete the following sentences:

1. Saprophytes get rid of _____ bodies.
2. Bugs are _____ parasites.
3. Aquatic living organisms get food and _____ from canals and _____ of the sponge.
4. _____ and _____ are saprophytes.

B. Choose the correct answer:

1. The food relationship between a tiger and a deer is _____.
   a. symbiosis b. saprophytism c. predation d. parasitism
2. _____ suck blood of fish.
   a. Bugs b. Fleas c. Ticks d. Jawless lampreys
3. Ascaris worm causes _____ disease.
   a. anemia b. bilharziasis c. elephantiasis d. malaria
4. _____ fungus decomposes orange fruit.
   a. Mushroom b. Bread mold c. Penicillium d. Yeast

2 A. Correct the underlined words:

1. Predators are the guards of nature. (_____)
2. Parasites are used in leather tanning industry. (_____)
3. Herbivores are autotrophic organisms. (_____)
4. Plants depend on air to get water and salts. (_____)
5. The interaction among the components of the ecosystem is temporary. (_____)

B. Give a reason for each of the following:

1. Predation is a temporary process.

_____

2. Dionaea feed on insects.

_____

3. The spider is a predator.

_____

Worksheets & Exams

3 **A. Compare between the effect of predation and saprophytes on the environmental balance.**

Predation	Saprophytism

B. What is meant by ...?

1. Mimicry.
2. Symbiosis.
3. Mutualism.
4. Prey.

4 **A. What happens when ....?**

1. The leguminous plants have no nodular bacteria in their roots.
2. A mosquito stands on your skin.
3. Chemical elements are not recycled by saprophytic organisms in the ecosystem.
4. Natural changes take place within the ecosystem.

B. Put (✓) in front of the right statement and (✗) in front of the wrong one:

1. The relationship between cat and rat is predation. ( )
2. Some living organisms can change their color to hide from their enemies. ( )
3. Lions, tigers and sharks are predators. ( )
4. The balance of the ecosystem occurs due to the interference of man. ( )

Test 3

1 A. Complete the following sentences:

1. Halophila is an ..... plant.
2. Legumes have ..... bacteria in their roots.
3. Camouflage and mimicry are ways of self-defence against .....
4. Ascaris worm is an ..... parasite.
5. Some autotrophic plants prey on insects to get the required elements for making .....

B. Choose the correct answer:

1. Parasites do not kill the ..... .
   a. predator b. saprophyte c. prey d. host
2. Mushrooms are ..... .
   a. predators b. parasites c. saprophytes d. preys
3. Lions are ..... .
   a. autotrophic b. parasites c. saprophytes d. predators
4. ..... is an insect-eater plant.
   a. Ascaris b. Bean c. Drosera d. Mushroom
5. Food chains and webs end by ..... .
   a. predators b. saprophytes c. parasites d. preys

2 A. What happens if ...?

1. Cutting down of trees.
   .....
2. Rabbits are introduced into an island with no natural enemies.
   .....
3. Killing the American hawks.
   .....

B. Write the scientific term for each of the following:

1. The natural area that includes living organisms together with non-living things. (.....)
2. The food relationship between two organisms and both get benefits. (.....)
3. The organism that decomposes the orange fruit. (.....)

Worksheets & Exams

4. The parasite that causes smallpox. (.....)
5. The insect that causes malaria disease. (.....)

3 A. Compare between parasitism and commensalism according to definition and give an example.

P.O.C.	Parasitism	Commensalism
Definition		
Example		

B. What is meant by ...?

1. Internal parasitism.
2. Saprophytism.
3. The ecosystem.
4. The environmental balance.

4 A. Give a reason for each of the following:

1. A chameleon can hide from enemies.
2. The food relationship between tiny aquatic organisms and the sponge is commensalism.
3. The food relationship between nodular bacteria and leguminous plants is mutualism.
4. The parasitism relationship differs from the predation relationship.

B. Put (✓) in front of the right statement and (✗) in front of the wrong one and correct it:

1. Commensalism ends by killing the prey or part of it. ( )
2. Ecosystem may be as large as the ocean. ( )
3. Man interference causes the environment balance. ( )

Second: Worksheets & Exams

Unit 1 Energy

Lesson 1 Light

P. 3

Worksheet (1)

1 A. 1. sunlight. 2. straight.
3. transparent material.
4. transparent – semi-transparent (translucent).
5. opaque.
6. inverted, minimized.

B. 1. It is the light energy that can be seen.
2. It is a darkened area that is formed as a result of falling of light on an opaque object.
3. They are the materials which allow some light to pass through and objects can be seen less clearly behind.

2 A. 1. a) minimized and inverted.
2. b) bigger
3. c) transparent materials.
4. c) regular reflection.

B. 1. The sunlight separates into 7 colors. and rainbow appears in the sky.
2. You can see your image.

3 A. 1. visible spectrum
2. opaque materials
3. semi-transparent (translucent) materials.
4. regular reflection 5. sun

B. 1. Because light travels in straight lines.
2. Because it reflects the sunlight that falls on its surface.
3. Because objects can be seen clearly (in full details) behind and they allow most light to pass through.

4 1. I can see the light of the candle.
2. I cannot see the light of the candle.
3. Light travels in straight lines.

Worksheet (2)

1 A. 1. bigger.
2. semi-transparent (translucent)– opaque.
3. light source – reflecting surface.
4. regular reflection and irregular reflection.
5. rainbow.

B. 1. Because no light falls on objects and no reflection occurs on our eyes, thus there is no vision
2. Because light travels in straight lines.
3. Because the white light consists of (7) seven spectrum colors.

2 A. 1. shadow 2. transparent material
3. light reflection (regular reflection)
4. irregular reflection
5. rainbow

B. 1. d 2. f 3. c 4. a 5. b

3 A. 1. (✓)
2. (✗) The image formed through narrow holes is always inverted
3. (✗) The formation of shadow shows that light travels in straight lines.
4. (✗) Carton is an opaque material and light cannot pass through.
5. (✗) A spoon appears broken when placed in a glass of water due to refraction of light.

B. 1. They are the materials that allow some light to travel through and things can be seen less clearly behind than the transparent one.
2. It is the reflection of light when it falls on a shiny surface.
3. It is the bouncing of light rays when it falls on a reflecting surface.
4. It is a material which doesn't let light to pass through.

C. 1. Due to light refraction.
2. Due to splitting of sunlight by drops of water forming seven-color rainbow.

4 A. 1. separation – seven spectrum colors.
2. Once these seven colors accumulate with each other, you can see the white light.
3. The visible white light is made up of seven spectrum colors.

B. 1. Light rays are reflected in different directions (Irregular reflection is formed).
2. The light rays are refracted.
3. The shadow is formed. (shadow of your hand is formed on the wall).

Lesson 2 Seeing colored objects

P. 7

Worksheet (3)

1 A. 1. transmitted light. 2. red.
3. red, green. 4. all – green one.

B. 1. (✗) it absorbs all light colors and reflects the red color only.
2. (✓) 3. (✓) 4. (✓)

2 A. 1. a) white 2. d) reflects 3. b) black

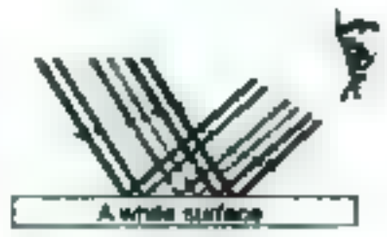
B. 1. The black object will absorb all light colors and seems black.
2. The black surface will absorb the red light and seems as it is (black).
3. The green window absorbs all light colors and allows the green color only to transmit through, so it seems green.

3 A. 1. white light
2. colored opaque objects
3. spectrum colors
4. black opaque objects

B. 1. Because it absorbs all light colors and transmits the green light only.
2. Because it absorbs all light colors and reflects the yellow color only.

4

A

White opaque objects	Black opaque objects
When the white light strikes the white opaque objects as shown, these objects reflect all the spectrum colors.	When the white light strikes the black opaque objects as shown, these objects absorb all the spectrum colors and do not reflect any color.
	
⇒ So, the white opaque objects appear to be white (the same color of light that falls on it).	⇒ So, the black opaque objects appear to be black.

B.1. The white light is formed.
2. By mixing the seven spectrum colors, the white light is produced (the white light is made up of seven spectrum colors).

Worksheet (4)

1 A. 1. white light. 2. white light.
3. colored opaque object, colored transparent object.
4. the primary light colors.
B.1. Sunlight will separate into seven spectrum colors.
2. The yellow color light is formed.
3. The white ball will appear with a green color.

2 A. 1. a. white opaque object
2. a. absorbs 3. c. green
4. c. cyan and yellow
5. b. red and blue
B. 1. reflection.
2. irregular reflection.
3. regular reflection.
C. 1. b 2. e 3. c 4. a 5. d

3 A. 1. (✗) The glass prism separates the white light into 7 colors.
2. (✗) When you mix the seven light colors, it gives white light.
3. (✓) 4. (✓)
5. (✗) Mixing red, green and blue gives the white light.
B. Answer by yourself.

4 A. 1. Because it reflects all light colors.
2. Because it absorbs all light colors.
B.1. red.
2. The apple appears to be black behind the green sheet.
3. spectrum colors.

Lesson 3 Magnetism

P. 11

Worksheet (5)

1 A. 1. Magnesia – iron
2. magnetic – non-magnetic.
3. north pole. 4. two poles.
5. repel – attract
B. 1. It is a black rock which is one of iron ores known as magnetite.
2. They are the materials which are attracted to the magnet.
3. It is a region (space) around a magnet in which the effect of the magnetic force appears.

2 A. 1. b. natural magnet
2. d. magnetic materials 3. b. south
4. a. the clips are attracted to the two poles of the magnet
5. c. wood
B.1. The magnet has two poles.
2. The freely moving (suspended) magnet always takes a fixed direction, which is (north-south) direction.
3. Like magnetic poles repel each other, but unlike magnetic poles attract each other.
4. The magnet is surrounded by an area called "Magnetic field".

3 A. 1. The north pole of the magnetic needle is directed towards the north direction of the Earth, while its south pole is directed towards the south direction of the Earth.
2. The magnet will take a fixed direction (north-south).
3. Iron paper clips are attracted to the magnet, while copper wire does not.
B.1. a natural 2. magnetite
3. magnetic materials 4. iron

4 A.

Magnetic substances	Non-magnetic substances
• Iron nails	• Plastic • Glass
• Paper clips	• Copper • Wood
• Iron car	• Aluminum
• Pins	• Gold

B.1. Because they are attracted to the magnet.
2. Because most of the magnetic force is concentrated at the 2 poles of the magnet.

Worksheet (6)

1 A. 1. (✓) 2. (✓) 3. (✗) 4. (✓)
B. 1. The north pole will be attracted to the south pole.
2. They will repel each other

2 A. 1. magnetic field.
2. south pole. 3. compass
4. magnetic force. 5. compass

B. 1. Because steel and cobalt are magnetic materials.
2. Because metallic paper clips are magnetic materials, while copper wires are non-magnetic materials.

3 A. 1. The regions of the magnet where most of the attraction force is concentrated.
2. They are materials which do not attract to the magnet.
3. It is the force by which the magnet attracts some materials.
B. approach a bar magnet to the two pieces of metals:
➡ The piece made of iron will be attracted to the magnet.
➡ The piece made of aluminum will not be attracted to the magnet.

4 A. 1. c 2. e 3. d 4. b 5. a
B. 1. north pole
2. middle of the magnet
3 south pole 4. B

Lesson 4 Magnetism and electricity

P. 15

Worksheet (7)

1 A. 1. electromagnet 2. increases
3. electric, magnetic
4. electric bell, cranes 5. cranes
B. The magnetic force of the electromagnet can be increased by.
a. Increasing the number of coil turns.
b. Increasing the number of batteries.

2 A. 1. a 2. b 3. d 4. b
B 1. and battery 2. increase
3. small dynamo

3 A .1. electromagnet 2. dynamo
3. huge dynamo 4. cranes
B.1. The magnetic force will increase.
2. The magnetic force will increase.

4 A. 1. Because the electric current intensity increases by increasing the number of batteries, so magnetic force increases.
2. Because iron nail changes into a temporary magnet.
3. Because it loses its magnetism when cutting electric current.

B.

	A	B
1. The name of device	Electromagnet	Dynamo
2. The idea of work.	electric energy changes into magnetic energy	mechanical energy changes into electric energy
3. Uses	TV, disc drive	lights the bulb of bicycle. lighting cities

Worksheet (8)

1 A. 1. kinetic , electric
2. the turns of coil, using strong magnet
3. small dynamo 4. magnetic
5. electromagnet
B. Answer by yourself.

2 A. 1. d 2. a 3. d 4. b
5. c 6. d 7. d
B. The dynamo changes the mechanical energy into electric energy.

3 A. 1. (✗) strong 2. (✓) 3. (✓)
4. (✗) increases 5.(✓) 6. (✓)
B. Answer by yourself.

4 A.

P.O.C.	Electromagnet	Dynamo
1. Scientific idea	changes the electric energy into magnetic energy.	changes the kinetic energy into electric energy.
2. Structure	coil - soft iron nail - battery.	magnet - coil.

B. 1. (a) magnet (b) copper coil
2. electric current
3. kinetic , electric 4. dynamo

TIMSS = Like questions on Unit 1

P. 19

1 a. steel - magnetic b. closed
c. ring, bar d. magnetism
e. keepers

2 a. south b. repel c. attract

3 a. electromagnet b magnetic pole
c. ammeter d. magnetic field line

4 1. south pole 2. Answer by yourself.
3. electromagnet 4. a magnetic material
5. switched on 6. increasing

5 2

Al-Adwaa General Tests on Unit 1

P. 21

Test 1

1 A. 1. rainbow. 2. magenta light color.
3. electromagnet. 4. white light.
5. spectrum colors.
B. 1. Because these materials are attracted to the magnet.
2. Because it reflects all light colors.

3. Because carton paper is an opaque material that does not allow the light to travel through.
4. Due to moving a coil between two poles of a magnet which generates electricity.

2 A. 1. seven - spectrum colors.
2. white light.
3. two - north - south.
4. absorbs - reflect.
5. a smooth and bright.

B. 1. You can see the picture less clearly.
2. Mixing the green and blue lights gives (yields) the cyan light color.
3. A magnet takes a fixed direction (north-south).
4. The blue bottle absorbs all the spectrum colors which fall on it and allows the blue light only to transmit through.

3 A. 1. wrought iron
2. minimized and inverted
3. yellow 4. its middle
5. white

B. 1. It is used to make the electric mixer.
2. It is used in electric power stations to generate electricity.
3. It is used in lifting heavy objects.

4 A. 1 The magnet has two poles.
2. The freely moving magnet always takes a fixed direction, which is (north-south).
3. Like magnetic poles repel each other, but unlike magnetic poles attract each other.
4. The magnet is surrounded by an area called "Magnetic field".

B. Answer by yourself.

C. (a) soft iron nail.
(b) electric wire (coil). (c) battery.

Test 2

1 A. 1. mechanical energy
2. Magnesia - iron 3. sunlight
4. red - blue

B. 1. fruit 2. yellow
3. reflect 4. north-south

2 A. 1. (✗) 2. (✓) 3. (✗) 4. (✓)

B. 1. The electric current is produced.
2. The image is formed.
3. The magnet takes a fixed direction (north-south).
4. The spoon seems broken due to light reflection.

3 A. 1. light refraction.
2. faster than.
3. Due to light refraction.

B. 1. d 2. f 3. c 4. a 5. b

4 A.

Regular reflection	Irregular reflection
It is light reflection when light rays fall on a smooth and shiny reflecting surface where light rays are reflected in one direction.	It is light reflection when light rays fall on a rough surface, where light rays are reflected in different directions.

B. 1. Because they allow most of light to pass through and we can see objects through them clearly.
2. Due to separation of white light into 7 spectrum colors.
3. To increase intensity of electric current so its magnetic force increases.
4. Because they are not attracted to the magnet.

Test 3

1 A. 1. seven 2. mechanical - electric
3. its two poles
4. red - violet 5. 50.

B. 1. secondary light colors.
2. irregular reflection.
3. triangular glass prism.
4. compass.
5. black opaque object.

2 A. 1. Because metallic paper clips are magnetic materials, while copper wires are non-magnetic materials.
2. Because it is produced by mixing two primary light colors (red & green).
3. Because it reflects the sunlight that falls on its surface.
4. Because the plane mirror reflects the falling light on it to reach my eyes causing the vision.
5. Because the two poles of its magnetic needle always refer to the north and south directions of the Earth.

B. 1. (✓) 2. (✗) 3. (✓) 4. (✗) 5. (✓)

3 A 1. I see minimized and inverted image for the flame of candle.
2. Because light travels in straight lines.

B 1. The compass is used to identify the four main geographical directions.
2. It is used for making the electric bell or cranes.

4 A. 1. Paper clips will be attracted to the magnet.
2. The two poles will repel each other

B. 1. It is used in separation of white light into 7 spectrum colors.
2. It is used in cranes to lift heavy steel blocks from one place to another
3. It is used in generating electricity from kinetic energy.

2 A.

Translucent materials	Opaque materials
They are the materials which allow some light to pass through and objects can be seen less clearly behind than the transparent.	They are the materials that do not allow light to pass through and objects cannot be seen behind.
Examples	
Tissue paper	Wood

B. 1. You are going to see your image which is formed on the frosted glass less clearly.
2. You will see an equal image for you on an equal distance. (The distance between you and the mirror is equal to the distance between the image and the mirror surface).
3. The black object absorbs all light colors and no light will be reflected.
4. It seems black, because banana absorbs all color lights except yellow color which it reflects and doesn't transmit through the red glass sheet.

3 A. 1. a 2. a 3. a 4. d
B. 1. d 2. f 3. c 4. a 5. b

4 A. 1. (✗) 2. (✓) 3. (✓)
B. 1. Magnetic materials: They are materials that attract to magent.
2. They are the materials which allow some light to pass through and objects can be seen less clearly through than the transparent.
3. Primary light colors: They are colored lights which cannot be produced by mixing two other colored lights.
4. Non-magnetic materials: They are materials that don't get attracted to magnet.

Exam 4

1 A. 1. rainbow. 2. reflect.
3. poles. 4. transparent.
5. repel - attract.
B. 1. Because it allows some light to pass.
2. Because it doesn't get attracted to magnet.

2 A. 1. natural magnet.
2. secondary light color.
3. opaque material.
4. visible spectrum. 5. shadow.
B. 1. Due to light refraction.
2. They will get attracted to each other.

3 A. 1. (✓) 2. (✗) 3. (✗) 4. (✗) 5. (✓)
B Answer by yourself.

4 A. Answer by yourself.
B. 1. white opaque object. 2. north- south
3. Faraday. 4. refracts.

Exam 5

1 A. 1. seven - prism 2. reflect
3. yellow - magenta - cyan
4. wood - chalk - glass
5. electric power
B. 1. The needle of the compass deflects
2. They will get attracted to each other.

2 A. 1. irregular reflection.
2. two poles.
3. William Gilbert.
4. magnetic force.
5. regular reflection.
B. Answer by yourself.

3 A. 1. (✓) 2. (✗) 3. (✓) 4. (✗)
B. Answer by yourself.

4 A. 1. two poles. 2. iron. 3. sun.
B. Answer by yourself.

Unit 2 Mixtures

Lesson 1 Mixtures

P. 37

Worksheet (9)

1 A. 1. pure substances – mixtures
2. carbon dioxide in a sugary solution
3. magnetic attraction.
4. shaking, stirring
B. 1. Pure substances: they are the substances which are made of only one type of identical particles.
2. Mixture: It is the substance that consists of more than one type of particles.
3. A solid-solid mixture: It consists of two or more different solid materials.
4. A liquid-liquid mixture: It consists of two or more different liquids.

2 A. 1. a 2. c 3. d 4. a
B. 1. b 2. a 3. d 4. e

3 A. 1. mixtures 2. mixtures
3. atmospheric air
4. mineral water 5. soda water
B. 1. Because the components of air keep their properties and it consists of more than one type of particles. (oxygen - carbon dioxide - nitrogen)

2. Because it is made up of only one type of identical particles.
3. Because sand does not dissolve in water.

4 A 1. A homogeneous salty solution is formed.
2 A heterogeneous solution is formed.
B. 1 concrete. 2. apple juice.

Worksheet (10)

1 A. 1. mixed , ratio
2. shaking, grinding 3. solid, magnetic
4. solid, soluble 5. liquid
B. 1. oil and water 2. stirring
3 salt and water 4. shaking
5. oil

2 A. 1. (✓) 2. (✗) separating funnel
3. (✗) shaking 4. (✗) insoluble
5. (✗) salt from water
B. 1. Because it consists of more than one type of solids.
2. Because it consists of more than one type of liquids.
3. Because it consists of solid and liquid matter.

3 A. 1. soda water 2. solution
3. solubility 4. evaporation
5. evaporation
B. 1. d 2. e 3. a 4. b 5. c

4 A. 1. separation of a mixture of sand-water.
2. separation of a mixture of oil-water.
3. separation of the magnetic substance from mixture.
B. 1. Separating funnel.
2. Because this tool is used to separate heterogeneous mixtures.
3. separate oil from water (heterogeneous liquid mixtures.

Lesson 2 Solutions

P. 41

Worksheet (11)

1 A. 1. homogeneous mixture
2. solvent/solute
3. solid/liquid 4. Answer by yourself.
5. suspension/suspended
6. mud in water/natural orange juice
7. stirring
B. 1. A type of mixtures in which we cannot distinguish between the components.
2. It is the substance in which a solute disperses or dissolves.
3. It is the process by which a solute dissolves in a solvent leading to the disappearance of the solute.

2 A. 1. (✗) homogeneous 2. (✓) 3. (✓)
4. (✓) 5. (✗) increase 6. (✓)
B. 1. Salt will be dissolved in the water forming a salty solution.
2. The sugar in the largest amount of water will dissolve faster than the other beaker that contains the less amount of water.

3 A. 1. Because its components cannot be distinguished.
2. Because its components can be distinguished.
3. It's a homogeneous mixture whose components can't be distinguished.
B. 1. decreases 2. evaporation
3. increases

4 A. Answer by yourself.
B. Activity on page 104 in the Main Book.

Worksheet (12)

1 A. 1. water 2. suspension/filtration
3. decrease 4. the amount of solvent
5. decrease
B. 1. The beaker whose temperature is higher dissolves faster than the other.
2. Solubility time will increase.
3. Solubility process will increase.

2 A. 1. heterogeneous mixture 2. solvent
3. solution 4. solute
B. 1. The quantity of salt in hot water. Because by heating the solubility process increases.
2. The quantity of sugar in water dissolved with stirring because by stirring the solubility process increases.
3. A quantity of salt in 300 ml of water. Because by increasing the solvent, the solubility process increases.

3 A. (1- c), (2- d), (3- a), (4- b)
B 1. Because it consists of more than one type of particles (solute and solvent).
2. Because mixtures are of 2 types: homogeneous and heterogeneous.
3. Because water has the ability to dissolve a lot of substances.

4 A. 1. more solvent (water). 2. increases.
B. 1

Mixture	Solution
It is a substance that is made up of more than one type of particles. A mixture can be classified into	It is a homogeneous mixture in which the solute breaks down into its most basic particles that spread throughout the solvent.

2.

Natural orange juice	Apple juice
Heterogeneous mixture	Homogeneous mixture

3

Solvent	Solute
It is the substance in which a solute disappears or dissolves.	It is the substance which dissolves in a solvent.

4.

Grinding	Shaking
It is used to form a mixture of salt and pepper (solid materials).	It is used to form a mixture of strawberry juice and banana juice. (liquid materials).

TIMSS — Like questions on Unit 2

P. 45

1 A. filtration process
B. evaporation process

2 The container that contains powder due to increasing the surface area exposed to the solvent.

3 (✓)

4 A. solvent - solvent - solute
B. evaporation.
C. The concentration increases.

5 A. A. sugar B. coffee
C. baking soda D. sand E. flour
B. disappeared.
C. Solid (c) - because carbon dioxide gas evolved.

Al-Adwaa General Tests on Unit 2

P. 47

Test 1

1 A. 1. solubility 2. mixture
3. evaporation 4. stirring
B. (1 – c), (2 – d), (3 – a), (4 – b)

2 A. 1. decreases 2. shaking
3. magnetic attraction 4. solution
B. 1. c 2. c 3. b

3 A 1. Because the solution consists of more than one type of particles (solute and solvent).
2. Because the components of this mixture can be distinguished (chalk - water).
3. Because the solubility process increases by increasing the temperature.
B 1. A pure substance. it is the substance that is made up of only one type of identical particles.
2. A mixture: it is the substance that consists of more than one type of particles
3. A solid-solid mixture: a mixture that consists of two or more different solid materials.
4. A liquid-liquid mixture: a mixture that consists of two or more different liquids.

4 A. 1. A solid-solid mixture is formed
2. A gaseous-liquid mixture is formed.
3. The solubility time increases.
4. Solubility process increases.
B. Answer by yourself.

Test 2

1 A. filtration - evaporation - separating funnel - magnetic attraction.
B. 1. (✗) 2. (✓) 3. (✓) 4. (✗) 5. (✓)

2 A. 1. salad dish 2. oil-water
3. atmospheric air
B. 1. water 2. evaporation
3. solution 4. filtration

3 A. 1. Because they are made of only one type of identical particles.
2. Because they are made of more than one type of particles.
3. Because it consists of different gases such as nitrogen, oxygen and carbon dioxide.
4. Because we can distinguish between its components.
B.

Solute	Solvent
It is the substance which dissolves in a solvent.	It is the substance in which a solute disperses and dissolves.

4 A. 1. The water will evaporate and salt will remain.
2. Solubility process increases.
3. Solubility process increases.
4. Heterogeneous mixture is fromed.
B. Answer by yourself.

Test 3

1 A. 1. We use the filtration method.
2. Separating funnel is used.
3. Evaporation process is used.
B. 1. solubility 2. solution
3. pure substances 4. stirring

2 A. 1. filtration 2. solute 3. temperature
B. 1. A salty solution is formed.
2. Iron filings are attracted to magnet and salt remains
3. Alloys are formed.
4. Salt dissolves more rapidly than sugar (solubility speed changes).

3 A. 1. A mixture: it is the substance that consists of more than one type of particles.
2. Homogeneous mixtures: mixtures whose components cannot be distinguished.
3. Heterogeneous mixtures: mixtures whose components can be distinguished.

B. 1. (✓) 2. (✗) 3. (✓) 4. (✓)

4 A.

Homogeneous mixture	Heterogeneous mixture
A type of mixtures in which we cannot distinguish between the components.	A type of mixtures in which we can distinguish between the components.

B. 1. Because we can distinguish between its components.
2. Because it consists of more than one type of particles.
3. Because it has the ability to dissolve thousands of particles of a solute in it.
4. Because the solubility process increases and takes short time by heating and stirring.

Unit 3 Environmental Balance

Lesson 1 Food relationships among living organisms

P. 53

Worksheet (13)

1 A. 1. symbiosis, saprophytism 2. the sun
3. predation, mutualism
4. autotrophic – photosynthesis
5. drosera – dionaea – halophila

B. 1. Autotrophic organisms: they are living organisms that can make their own food by themselves.
2. Predation: it is a food relationship among living organisms, where one living organism devours another one.
3. Predator: it is the living organism which devours the living organism.
4. Prey: it is the living organism which is devoured.

2 A. 1. predation 2. sepia 3. chameleon
4. saprophytes 5. mutualism

B. 1. autotrophic 2. sepia
3. predator 4. predation

3 A. 1. Because lions feed on deer which feed on plants.
2. To get nitrogen to make proteins.
3. As plants can make its own food by photosynthesis.
4. Because it has nodular bacteria in its roots to fix nitrogen in an inorganic form for the plant.
5. It feeds on insects to get the required elements for making proteins.

B.

P.O.C.	Camouflage	Mimicry
Definition	A phenomenon in which the living organism protects itself from enemies by changing its color of its surrounding environment.	A phenomenon in which the harmless living organisms imitate other harmful or poisonous living organisms to frighten their enemies and escape from them.
Ex.	Frog and chameleon	Some bees that look like wasps in forming lines.

4 A. 1. They cannot frighten their enemies.
2. No life as all organisms depend on plants as a source of food directly or indirectly and plants will die if no photosynthesis.

B. Examples on page 125 in the Main Book.

Worksheet (14)

1 A. 1. insects 2. camouflage
3. predation – saprophytism 4. indirectly

B. 1. Because a chameleon changes its color to simulate the color of the surrounding environment.
2. Because the parasite will lose its source of food and shelter.
3. Because they live externally on the host's body and feed by sucking its blood.
4. Because they get their food by decomposing food remains or bodies of dead organisms.

2 A. 1. d 2. c 3. a 4. c

B. 1. A dark green layer is formed on the bread; that is, the bread will be rotten.
2. The Earth's surface will be covered with the bodies of dead organisms.
3. Sepia ejects black fluid to escape from its enemies.
4. A chameleon cannot hide from their enemies.

3 A. 1. protein 2. commensalism
3. mimicry 4. spiders

B. 1. (e) 2. (d) 3. (b) 4. (c) 5. (a)

4 A. 1. (✗) internal 2. (✓)
3. (✗) mutualism, commensalism & parasitism 4. (✓)

B. 1. a. Tiny aquatic organisms get shelter and food from the canals and fissures of a sponge.
b. They change some food remains to vitamin B.
2. (1) saprophytism (2) predation
(3) predation (4) parasitism

Lesson 2 Environmental balance

P. 57

Worksheet (15)

1 A. 1. ecosystem 2. large
3. water 4. soil 5. dinosaurs
B. 1. Animals feed on the plants directly or indirectly.
2. Fungus decompses the animals after their death and recycle the chemical elements to the soil.

2 A. 1. small 2. (a, b)
3. change in natural conditions
4. organizes 5. environmental imbalance
B. 1. getting rid of the bodies of dead organisms by decomposing them.
2. recycling the chemical elements found in the bodies of dead organisms.

3 A. 1. ecosystem 2. predation
3. environmental balance
4. the universe
B. 1. to make photosynthesis.
2. to recycle elements such as carbon, nitrogen and sulphur in nature.
3. in food industries such as cheese and yoghurt, in drugs industry such as antibiotics and in leather tanning industry.
4. to keep the environmental balance.

4 A. 1. This leads to spreading of rats with loss of crops.
2. Increase in number of prey populations and the food resources become insufficient for prey populations leading to the competition between members of prey populations so they will die.
3. Disturbance in the environmental balance.
4. Life will be stopped as new plants cannot find elements to grow.
B. Answer by yourself.

Worksheet (16)

1 A. 1. c 2. d 3. b 4. d
B. 1. a. Getting rid of the bodies of dead organisms by decomposing them.
b. Recycling the chemical elements found in the bodies of dead organisms.
2. - Predation relationship plays an important role in keeping the environmental balance.
- Predation organizes the number of prey populations.

2 A. 1. (✗) balance 2. (✗) dinosaurs
3. (✗) imbalance
4. (✗) imbalance 5. (✓)
B. 1. Due to the change in natural conditions in the ecosystem that causes the disappearance of dinosaurs.
2. Because they make their own food during photosynthesis process.
3. Due to the insufficient food resources for prey populations.

3 A. 1. predation 2. continuous
3. energy 4. small
B. 1. predator 2. competition
3. saprophytism

4 A. 1. Ecosystem: it is a natural area including living organisms and non-living things.
2. Environmental balance: it is the balance among the components of the ecosystem.
B.1. Food industry such as cheese, bread, yoghurt, vinegar and alcohol.
2. Drug industry such as antibiotics.
3. Leather tanning industry.
4. Making of the natural manure.

TIMSS Like questions on Unit 3

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1 1. b 2. d 3. c 4. e 5. a

2 A. (i) light energy to chemical energy.
(ii) chemical energy.
B. bacteria.

3 A. (i) The arrows show the direction of energy flow (the second organism feeds on the first one).
(ii) zebra - gazelle. (iii) cheetah - lion.
B. Draw by yourself.

4 1. parasite 2. host 3. filarial worm 4. bug

Al-Adwaa General Tests on Unit 3

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Test 1

1 A. 1. plant 2. shelter 3. camouflage
4. spider
B. 1. (✗) 2. (✓) 3. (✓) 4. (✗) 5. (✓)

2 A. 1. parasite 2. external parasite
3. inorganic 4. parasite 5. temporary

B. 1. predation 2. mutualism
3. saprophytism 4. external parasitism
5. external parasitism

3 A. 1. parasitism 2. anemia
3. insectivorous plants
4. environmental balance

B. 1. Predation: it is a temporary food relationship that ends by the devouring of the prey or a part of it.
2. A predator: the animal which devours another animal.
3. The host: the living organism in parasitism which is harmed.
4. External parasitism: it is a food relationship in which the parasite lives externally on the host's body and feeds by sucking the blood of the host and conveys diseases to it.

4 A. 1. Because plants are autotrophic organisms that can make their own food by photosythesis process.
2. Because lion feeds on deer.
3. To hide from its enemies.
4. To hide from its enemies.

B.

P.O.C.	Commensalism	Mutualism
Definition	It is a food relationship between two living organisms, where one of them benefits from the other, while the other neither gets benefit nor is harmed.	It's a food relationship between two living organisms where each one benefits from the other.
Example	The relation between the sponge and tiny aquatic living organisms.	The relation between nodular bacteria and leguminous plants

Test 2

1 A. 1. dead 2. external
3. shelter – fissures
4. mushroom fungus, bread mold fungus

B. 1. predation 2. jawless lamprey
3. anemia 4. penicillium

2 A. 1. saprophytes 2. saprophytes
3. green plants 4. soil 5. continuous

B. 1. Because it ends by devouring the prey
2. To get the required elements (nitrogen) to make proteins.
3. As it devours insects.

3 A.

	Predation	Saprophytism
	1. It organizes the number of prey populations to keep the ecosystem balanced. 2. Predators get rid of weak or sick members and let strong ones in prey populations to preserve their existence and to reproduce adding strong members to the populations.	As bacteria and fungi decompose dead bodies, wastes and food remains. These scavengers offer great services: 1. Completing the food chains and webs. 2. The recycling of the chemical elements such as carbon, nitrogen and sulphur within the ecosystem to make living organisms benefit from them. 3. Getting rid of dead bodies, wastes and food remains.

B.

1.	Mimicry	A phenomenon by which the harmless living organisms imitate other harmful or poisonous living organisms to frighten their enemies and escape from them.
2.	Symbiosis	It is a common food relationship between two different types of living organisms; one of them benefits from the other and the other may benefit (mutualism) or neither benefits nor is harmed (commensalism) or is harmed (parasitism).
3.	Mutualism	It is a food relationship in which each organism gets benefit (in the form of food) from the other and is not harmed.
4.	Prey	It's the animal which is devoured by predator.

4 A. 1. They will not be able to take their needs of nitrogen and will not be able to grow and form proteins.
2. The mosquito absorbs your blood and may convey malaria disease to you.
3. This causes the environmental imbalance.
4. This may lead to extinction of some living organisms.

B. 1. (✓) 2. (✓)
3. (✓) 4. (✗) (imbalance)

Test 3

1 A. 1. insectivorous 2. nodular
3. predation 4. internal
5. protein

B. 1. host 2. saprophyte
3. predators 4. drosera
5. saprophytes

2 A. 1. Enviromental imbalance occurs.
2. They increase in number and compete for food and then they die of hunger and this will cause disturbance in the environmental balance.
3. It will cause an increase in the numbers of rats and then loss of crops leading to disturbance in the environmental balance.

B. 1. ecosystem 2. mutualism
3. penicillium. 4. fleas 5. mosquitoes

3 A.

P.O.C.	Parasitism	Commensalism
Definition	It is a food relationship between two different kinds of living organisms in which one benefits, while the other is harmed.	It is a superficial food relationship between two living organisms; one of them benefits from the other, while the other neither gets benefit nor is harmed.
Example	The relation between bilharzia worm and man.	The relation between the sponge and tiny aquatic organisms.

B. 1. Internal parasitism: it is a food relationship in which the parasite lives internally inside the host's body and shares the host's digested food or feeds on its tissues and cells.
2. Saprophytism: it is a food relationship in which the saprophytes (decomposers) get their food by decomposing food remains or bodies of dead organisms.
3. The ecosystem: it is a natural area that contains some living organisms (such as plants and animals) and non-living things (such as air, water and soil).
4. The environmental imbalance: it is any disturbance that affects the environmental balance.

4 A. 1. It changes its color to simulate the color of the surrounding environment.
2. Because tiny aquatic organisms get shelter and food from the canals and fissures of a sponge which neither benefits nor is harmed.
3. Because bacteria fix nitrogen in an organic form to provide the plant with it and bacteria benefit from sugars made by plants during photosynthesis.
4. Because the parasite depends on the host completely to get food causing its weakness, but not death (does not kill) as predators kill prey.

B. 1. (✗) (predation) 2. (✓)
3. (✗) (imbalance)

Exams on the second part of the first term

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Exam 1

1 A. 1. ecosystem
2. decompose
3. predation
4. grinding - stirring - shaking

B. 1. predation
2. mutualism

2 A. 1. water and lemon juice
2. separating funnel
3. camouflage
4. dinosaurs

B. 1. Making a disturbance in the environmental balance.
2. Water will evaporate and salt will remain.

3 A. 1. solubility process
2. decomposer
3. (solid-liquid) mixture as salty solution
4. salty solution.
5. internal parasite

B. 1. separating funnel.
2. filtration.

4 A. 1. (✗) 2. (✗) 3. (✓) 4. (✗)
B. Answer by yourself.

Exam 2

1 A. 1. fungus 2. filtration
3. solution 4. solute

B. 1. Because it ends by devouring the prey.
2. Answer by yourself.

2 A. 1. solubility process.
2. environmental balance. 3. pure.
4. solvent. 5. predation.

B. Answer by yourself.

3 A. 1. (✗) 2. (✓) 3. (✗) 4. (✓) 5. (✓)
B. 1. seperating funnel.
2. magnetic attraction.

4 A. 1. (c) 2. (a) 3. (d) 4. (e)
B. Answer by yourself.